2. Sheets. Sheet. 1.

D. Lane,

Water Wheel.

No. 107,789. Patented Sept. 27. 1870.

Fig. 1.

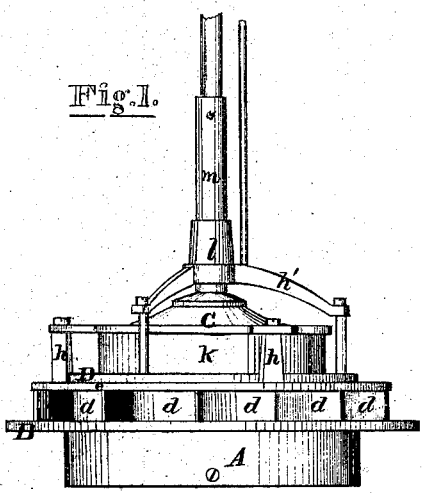


Fig. 2.

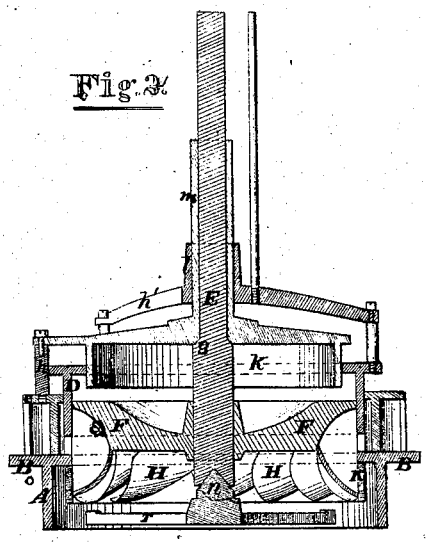
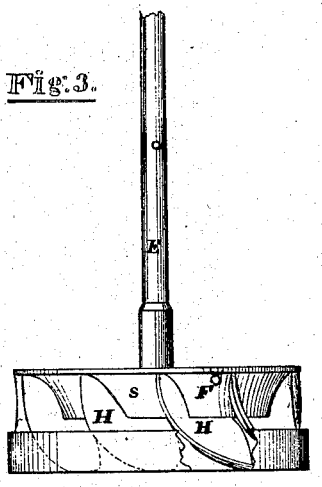


Fig. 3.



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2. Sheets Sheet. 2.

Water Wheel.

No. 107,789. Patented Sep. 27. 1870.

Fig. 4.

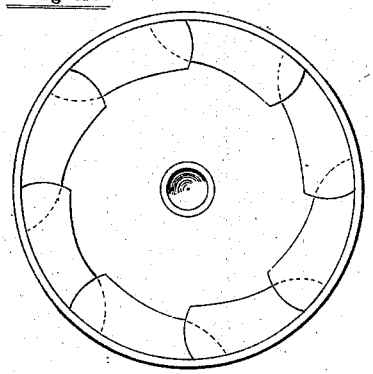


Fig. 5.

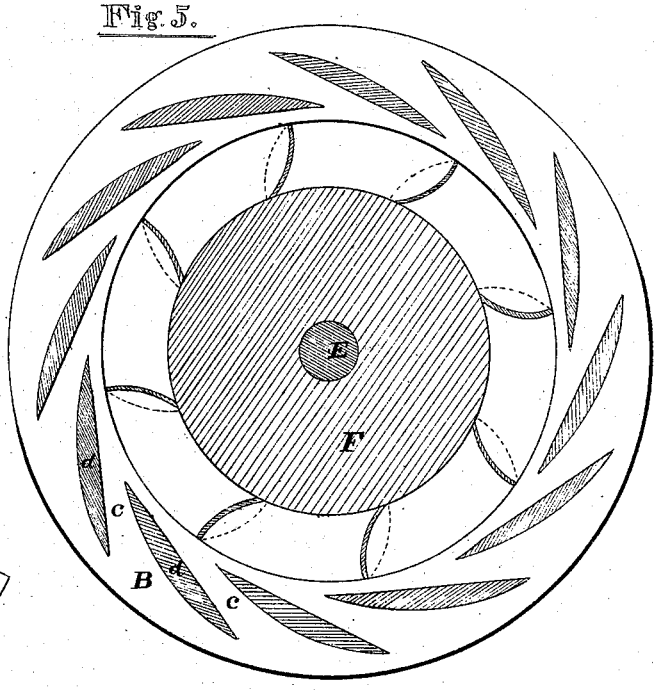
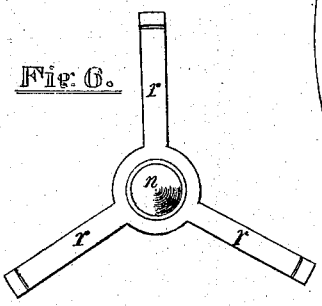


Fig. 6.



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United States Patent Office.

DENNIS LANE, OF MONTPELIER, VERMONT.

Letters Patent No. 107,789, dated September 27, 1870.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, DENNIS LANE, of Montpelier, in the county of Washington and State Vermont, have invented a new and valuable Improvement in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a side view of my invention.

Figure 2 is a central vertical section of the same.

Figure 3 is a side view of the wheel.

Figure 4 is a bottom view of the wheel.

Figure 5 is a horizontal section of the case.

Figure 6 is a top view of the pivot with its arms

My invention relates to turbines, and consists in the construction and novel arrangement of the annular gate between the chutes and the buckets; in the cylindrical guide, attached to the upper part of the case, and arranged to keep the gate in proper position as it rises; and in the novel form and arrangement of the buckets and other parts of the wheel.

In order to procure accuracy and precision of operation on the part of an annular gate, a cylindrical guide is usually employed.

This guide may be attached to the case of the turbine in such a manner that the gate, in rising, either slides within or without the guide.

In my invention the latter arrangement is adopted.

The letter A of the drawing designates the cylindrical base of the case of my wheel.

To the upper part of this cylinder is attached a circular horizontal flanch, B, arranged to extend inward a short distance beyond the inner ends of the partitions which form the chutes *c*.

Upon the flanch B, the circular series of chutes *c* is constructed, the partitions *d* being surmounted by the annular plate *e*.

Secured to the upper surface of this annular plate are the supports *h*, to which is bolted the top C of the case, from which extends downward a circular flanch, *k*, which serves as the guide for the gate.

D is the cylindrical gate, moving vertically between the chutes on the one hand, and the buckets and guide on the other.

It is connected by the rods or arms *h'* with the sleeve *l*, which slides over the sleeve *m* of the case.

E represents the shaft of the wheel, arranged to rotate on the pivot *n*, which is attached to the case by the arms *r*.

The shaft is shouldered at *g* to assist in supporting the top C.

F is the body of the wheel, a basin-shaped casting, hollowed in its upper surface, and extending downward for about half the depth of the wheel.

The under surface of the body F is plane and somewhat smaller in diameter than the upper surface, being connected thereto by a circular concave wall, *s*, to which the upper portions of the buckets are secured.

The buckets H are attached partly to the concave wall *s*, and partly to the perimeter of the bottom of the casting F.

From the line of attachment to this casting F, each bucket curves downward and outward to the circumscribing band K, which binds the lower portions of the buckets together, and, at the same time, forms the outer wall thereof.

This circumscribing band extends upward from the bottom of the wheel to about half its height, and in consequence of the strength obtained thereby, the lower or reactionary portion of the bucket can be very much extended.

In my wheel each bucket, after it joins the band K, extends to the rear at an angle of about twenty degrees, terminating at the lower edge of the band, immediately under or a little in rear of the point of junction of the succeeding bucket.

It will also be observed that the position and curvature of the buckets are such that, whatever quantity of water is admitted through the gate from the chutes, it will operate both in the direct action and reaction upon the outermost portions of the buckets, thereby securing the greatest amount of leverage consistent with the diameter of the wheel.

The operation of my wheel is as follows:

The gate is elevated to a sufficient height to admit the desired quantity of water to the buckets.

The water is directed by the tapering chutes upon that portion of each bucket which is above the band K.

The impetus of the water having been expended upon this portion of the bucket, its reactionary force or weight operates upon the lower or inclined portion of the bucket within the circumscribing band.

The water is prevented from passing downward over the exterior surface of the band K by the inner edge of the flanch B of the case, which extends over and covers the the upper edge of the band.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The annular gate D, moving exteriorly upon the guide *k* and between the wheel and the chutes *c*, substantially as specified.

2. In combination with the annular gate D, descending within the circle of chutes, and the sleeve *l*, the arms *h'*, passing entirely without the case, as specified.

3. The water-wheel herein described, consisting of the basin-shaped casting F, connected with the circumscribing band K by the buckets H, inclined from the lower edge of the casting downwardly and outwardly to the band, as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

DENNIS LANE.

Witnesses:

E. M. GUERNEY,

GEO. L. LANE.