L. LONG.

WATER-WHEELS

No. 181,084. Patented Aug. 15, 1876.

Fig: 1.

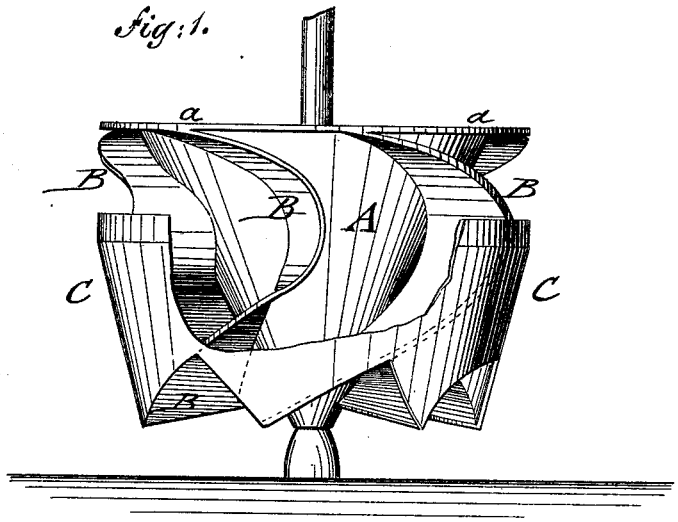
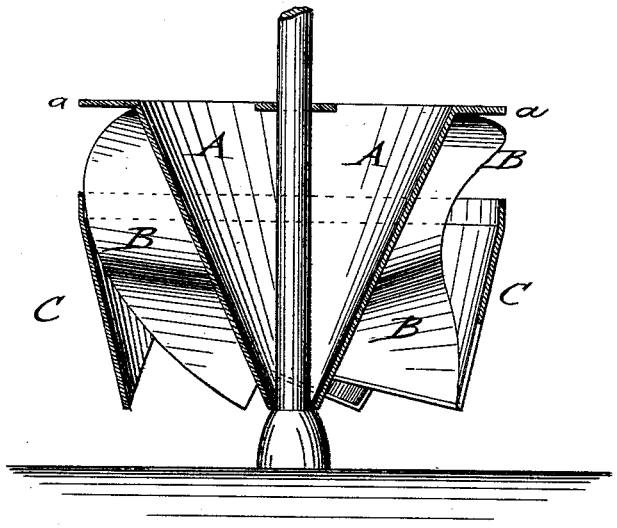


Fig: 2.



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LEONARD LONG, OF PRINCETON, WISCONSIN.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **181,084**, dated August 15, 1876; application filed January 22, 1876.

To all whom it may concern:

Be it known that I, LEONARD LONG, of Princeton, in the county of Green Lake and State of Wisconsin, have invented a new and Improved Water-Wheel, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of my improved water-wheel; and Fig. 2, a vertical central section of the same.

Similar letters of reference indicate corresponding parts.

My invention relates to improvements in water-wheels for the purpose of utilizing as much as possible the power of the water, diminishing the friction of the shaft on step, and allowing free flow and reaction of water, to increase capacity of wheel.

The invention consists, mainly, of buckets arranged between an interior cone hub and an exterior cone cylinder, the buckets extending from an outer top flange of the inner cone on an inclined segment of a circle to the cone cylinder, and then on an inward and downward spiral curve to the bottom of the same and the lower part of the cone hub.

In the drawing, A represents the interior part or hub of my improved water-wheel, which hub is made in the shape of an inverted cone, with a circumferential flange, *a*, on top or at largest diameter of cone. The lower end of hub or cone is made as small as the diameter of step of wheel-shaft will allow, as shown in Fig. 2.

The object of the cone hub is to admit the water to pass as near as possible on a straight line in downward direction and to center of wheel.

The buckets B commence at the lower side of flange *a*, and pass then along an incline and around a segment of a circle in forward and downward direction to about the upper edge of the outer cone cylinder C, and then on an inward and downward spiral incline to the bottom or lower edge of outer cylinder, and the lower part of cone hub A, forming a bucket of circular and spirally-curved shape. The water passes in along the under side of top flange of hub, and along the top section of the buckets, and produces thereby a lifting-force that diminishes the friction of shaft on step of wheel. The upper part of cone cylinder C is cylindrical, while the lower part may be made at any angle, or of a curved or bent bucket shape, so as to produce or allow an inward course or centripetal motion of the water.

The inverted-cone part may be made from an angle of forty-five degrees up to a perpendicular with the upper cylindrical part, so as to form in the latter case an extension of the cylindrical section.

The cone cylinder C is made fast to the buckets B, or solid with case, as desired. The lower part of the cone cylinder C is cut out from the lower point of bucket upward on an angle or circle, until it meets or comes in contact with the under side of the next adjoining bucket above.

The water passes in between top flange and upper edge of cone cylinder, and strikes the buckets upon the under or concave side, passing around the curved part and reacting upon the lower portion of curved incline and top of bucket. The cone cylinder assists the cone hub in producing the centripetal motion or force of the water, and brings the water gradually to the smallest diameter of wheel during the time that the reaction of the same is exerting its force. The outside cone cylinder is, further, placed in such connection with the buckets that a straight line drawn from the lower point of a bucket on the under side along or up the curved incline shall be below the top edge of said cylinder, which causes the impinging-point of the centripetal force and the reaction of the water to meet at the outer edge or section of the bucket and hold it in a line parallel with the rotation of the wheel. The water, when leaving the wheel at the lower part of the buckets, is allowed to pass out through the cut-out or recessed parts of the cone cylinder, allowing free flow and reaction, and giving thereby greater capacity and working power to the wheel, as the full force of the water is utilized during its passage through and egress from the buckets.

The angles of cone hub A′ and cone cylinder C are made parallel with the angle of water-chutes, which keep the water in a straight line and parallel with the line of chute passing it around the circle form of bucket, and

along down the cones, producing, in connection with the rotation of wheel, centripetal motion. The water passes out of the wheel in a line parallel with the line of entrance, and issues sidewise through the notches or recesses of the cone-cylinder, and downward free and unobstructed, thereby giving the greatest advantage to direct action and reaction; also allowing the water, during reaction, to gradually pass to a smaller diameter as its velocity is gradually decreased during reaction. A further advantage of the wheel is that it can be changed from its largest capacity to the smallest size without changing line or angle, and by using the cone hub with as small a diameter as shaft will allow. The buckets, being a section of a cone tube cut diagonally so as to fit the cone hub, are applied spirally to it, the point or center of said cone tube being at one side of the center, or near the center, of water-wheel shaft.

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

1. A water-wheel composed of a flanged interior cone hub, inclined and spirally-curved buckets, and a cone cylinder, extending to lower edge of buckets, the whole constructed substantially in the manner and for the purpose set forth.

2. A water-wheel provided with buckets extending from the top flange of inner cone hub, first along and around a segment of a circle to the upper edge of the outer cone cylinder, and down along an inward and downward spiral inclination or twisted spiral to the lower part of cone cylinder and cone hub, substantially as described.

3. A water-wheel having interior hub of inverted conical shape, with flange at top or larger diameter, to throw water with centripetal motion toward center of wheel, substantially as specified.

LEONARD LONG.

Witnesscs:
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