

(No Model.)

L. L. RANDALL.
WATER WHEEL.

No. 323,734.

Patented Aug. 4, 1885.

Fig. 1.

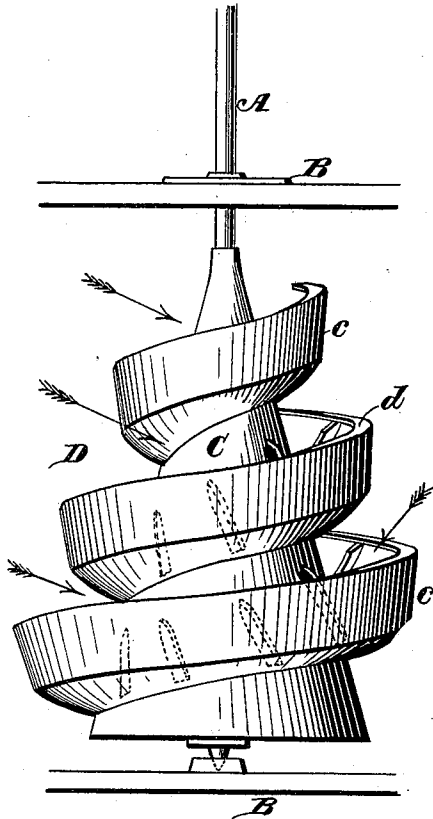


Fig. 2.

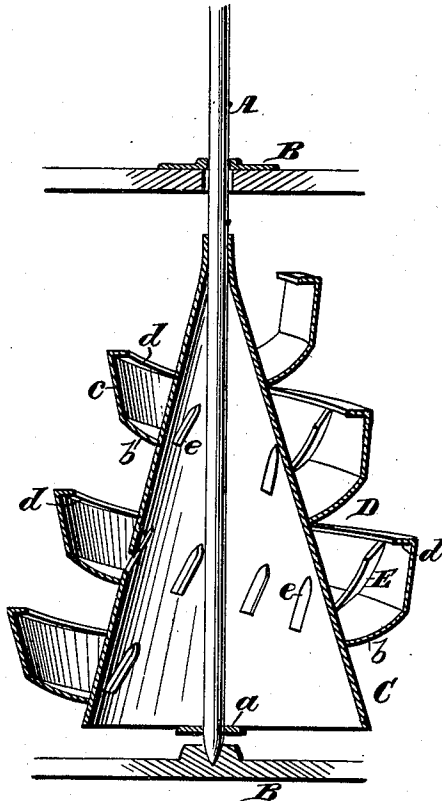


Fig. 3.

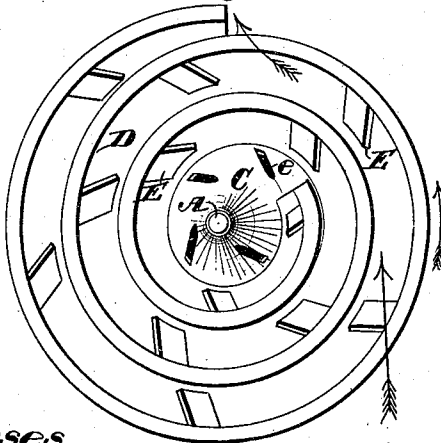
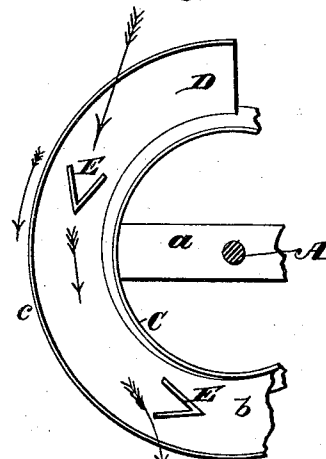


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

LEWIS L. RANDALL, OF HAWKINSVILLE, GEORGIA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 323,734, dated August 4, 1885.

Application filed May 15, 1885. (No model.)

To all whom it may concern:

Be it known that I, LEWIS L. RANDALL, a citizen of the United States, residing at Hawkinsville, in the county of Pulaski and State of Georgia, have invented new and useful Improvements in Water-Wheels, of which the following is a specification.

This invention relates to turbine water-wheels; and it consists of a hollow cone surrounded by a concaved spiral water-way having flaring sides and containing V-shaped buckets, the sides of the hollow cone being provided with openings that communicate with the spiral water-way, to permit the escape of dead-water through the cone.

The invention further consists in certain peculiarities in the construction and combination of parts, as hereinafter set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical side elevation of my improved turbine. Fig. 2 is a sectional side elevation of the same. Fig. 3 is a top view of the turbine, and Fig. 4 is a sectional plan showing a modification in the arrangement of the buckets.

A is a shaft to which the turbine is fixed, and B B are bearings for said shaft. The hollow cone C, that forms the body of the turbine, is open at its lower enlarged end, and has a cross-piece, *a*, for attachment of the turbine shaft or stem A, to which the upper end of the cone is secured in any suitable or convenient manner.

Upon the outside of the cone C, and extending from above downward, is a spiral water-way, D, having a concaved bottom, *b*, and provided with flaring sides *c*, as shown in Figs. 1 and 2. This water-way is provided at intervals with buckets EE, that may be arranged in a vertical or an inclined position against the flaring sides *c c*, so as to form V-shaped angles therewith, as shown in Fig. 3; or the buckets may be made V-shaped and be arranged vertically upon the bottom of the water-way, about midway between the flaring side of said water-way and the side of the cone, as shown in Fig. 4.

It may be remarked that the arrangement of buckets shown in Fig. 3 is best suited for use where the turbine is to be driven by fall-

ing water, while the form of bucket shown in Fig. 4 is designed for use in running water.

On the upper edge or rim of the water-way, and projecting inward from its flaring sides *c*, as shown in Fig. 2, I prefer to place a flange, *d*, to catch the upward side pressure of water. This inward-projecting flanged rim may, however, be dispensed with, and is not required when the turbine is to be set in running water.

The walls of the hollow cone C are provided with openings *e e*, that are arranged at intervals above the spiral water-way D, for the escape of dead-water through said cone.

The upper end of the shaft A may be extended any desired distance, and be journaled and geared in any convenient manner to transmit power.

Where there is a sufficient fall of water the turbine may be placed upright; or it can be partly or wholly submerged in an inclined or a vertical position in running water, as may be found most convenient or desirable. Owing to the lightness of its construction, it is obvious that a large amount of power with great speed will be obtained with a slight fall or current of water. This is due to the form of the spiral water-way D upon the hollow cone C in conjunction with the buckets E, as described, by which a continuous and steady pressure of water is maintained within the turbine.

It will be observed that the form and construction of the turbine is such that it will withstand a great pressure when made of light but durable material. It can therefore be used successfully with currents of greater or less force.

It will be seen that the turbine has three exits or exhausts for the escape of water—namely, through the openings *e e* into the hollow cone; also, over the rim of the water-way; and, lastly, at the foot or lower end thereof, the last, therefore, exerting a running force after the weight of the water has expended itself.

By placing the cone upon the shaft A in a slightly-inclined position, as shown in Fig. 2, the weight of the turbine is more equally distributed upon its shaft than would be the case if said shaft were passed directly through the center of the cone.

What I claim as my invention is—

1. A turbine consisting of a hollow conical body having openings for the escape of dead-water, a spiral water-way surrounding said conical body, and buckets placed at intervals
5 in said water-way, substantially as described.

2. A turbine consisting of a hollow conical body having openings for the escape of dead-water, a spiral water-way surrounding said conical body, and having a concaved bottom
10 and flaring sides, and buckets placed at intervals in said water-way, substantially as described.

3. In a turbine water-wheel, the combination of the cone C, fixed to a shaft, and provided with openings *e e*, the spiral water-way
15 D, secured to the outer side of said cone, and provided with a concaved bottom, *b*, and flar-

ing side *c*, and the V-shaped buckets E E, substantially as described.

4. In a turbine water-wheel, the combination of the cone C, fixed to a shaft, and provided with openings *e e*, the spiral water-way
D, secured to the outside of said cone, and provided with a concaved bottom, *b*, flaring side
20 *c*, and flanged rim *d*, and the buckets E E, arranged in said water-way, substantially as described.
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In testimony whereof I affix my signature in presence of two witnesses.

LEWIS L. RANDALL.

Witnesses:

MARK T. HODGE,

GUY F. HARVARD.