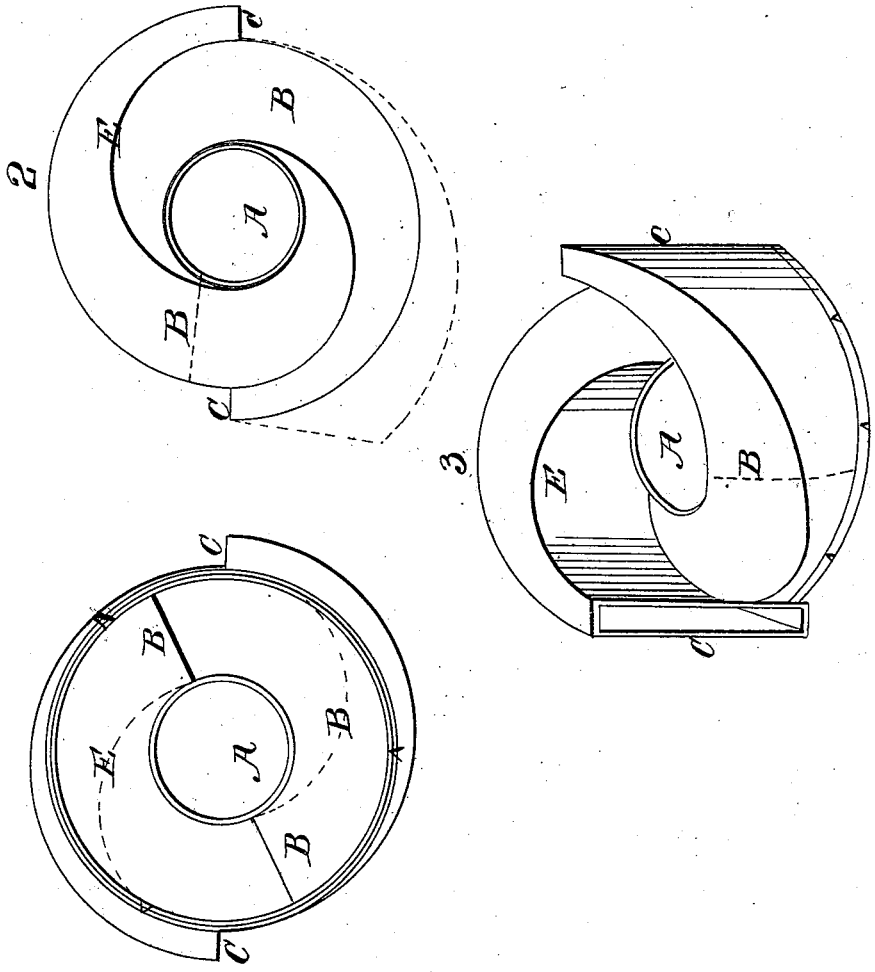
R. Summers,

Water Wheel.

No. 4,474. Patented Apr. 25, 1846.



UNITED STATES PATENT OFFICE.

RALPH SUMMERS, OF SENECA FALLS, NEW YORK.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 4,474, dated April 25, 1846.

To all whom it may concern:

Be it known that I, RALPH SUMMERS, of Seneca Falls, in the county of Seneca and State of New York, have invented a new and useful Improvement in the Reaction Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in constructing the wheel so that the whole surface of the water that bears against the face of the wheel can be discharged near the periphery thereof in an axial line, the area of the whole passage being the same, while its figure changes from an oblong horizontal to an oblong vertical figure, and the length of the passage being sufficient to admit of the change. There may be any reasonable number of issues or discharging-orifices in my improved wheel; but I prefer two only, as being the most convenient and efficient. There is in this as in other reacting-wheels a central opening or eye for the shaft of the wheel, and at or near the periphery of the wheel is a ring projecting about one inch from the face thereof. This ring is turned true and smooth, and when the wheel is set up it comes nearly in contact with the trunk, penstock, or flume, which conducts the water to the wheel, thereby preventing the escape of the water.

In the drawings, Figure 1 is a plan of the face of the wheel. A is the opening or eye for the shaft. A′ A′ is the projecting ring above named. B B are flat plates extending from the eye to the rim of the wheel. These plates extend spirally around the eye of the wheel in the same plane as the thread of a screw, and at an angle of from fifteen to twenty-two degrees, and, after passing around one-half the circumference of the wheel, they begin to lap or extend over each other, as at B′ B′, so as to form the orifices at which the water enters. At that point they are at a distance from each other about equal to their width, and there form the two opposite sides of the vent, the other sides being made by the eye and rim of the wheel. From thence the curved passages are gradually enlarged in the direction of the axis of the wheel by the inclination of plate B, and they are contracted in the direction of the radius by plate E, that curves outward from the eye to the periphery, where the water is discharged. The inclination of these plates is so proportioned that the sectional area of the passage remains the same throughout, or from B to C, when the water is discharged. The dotted lines in Fig. 1, E, shows the inner curved plate, and the whole form is more clearly represented in Fig. 2, which is the back view of a wheel made to run in a contrary direction to that represented in Fig. 1.

Fig. 3 is a perspective view of the wheel, the letters referring to the same parts as in Figs. 1 and 2.

The advantages derived from the above-described wheel are as follows: The water enters on the face of the wheel, (shown in Fig. 1,) having the whole wheel, except the eye, for entrance, presses upon the plates B B, giving motion in the same direction as the reacting pressure or vent at *c*, to which it passes readily and freely through the curved passages without changing its relative direction, and the water, being drawn into a thin broad sheet at the point of discharge, act more equally and powerfully in consequence of the whole column being discharged as far as practicable, consistent with compactness, from the center.

Having thus fully described the construction of my wheel, what I claim therein as new, and desire to secure by Letters Patent, is—

Constructing the wheel so that the water shall be received upon an inclined surface extending from the eye to the periphery, and thence entering the passage upon the same surface undiminished in width, said passage increasing in the direction of the axis and diminishing in the direction of the radius, so that the areas of all its sections shall be substantially equal, and so located and extended that the water shall all be discharged immediately outside of the periphery in a thin tangential sheet whose plane is parallel to the axis, the whole being constructed and combined substantially as herein set forth.

RALPH SUMMERS.

Witnesses:

JOHN MAYNARD,

WASHBURN RACE.