J. Denison,

Water Wheel.

No. 4,471. Patented Apr. 25, 1846

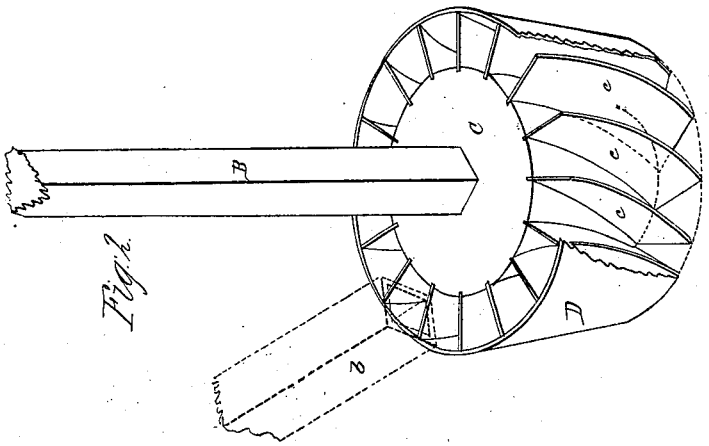

Fig. 2.

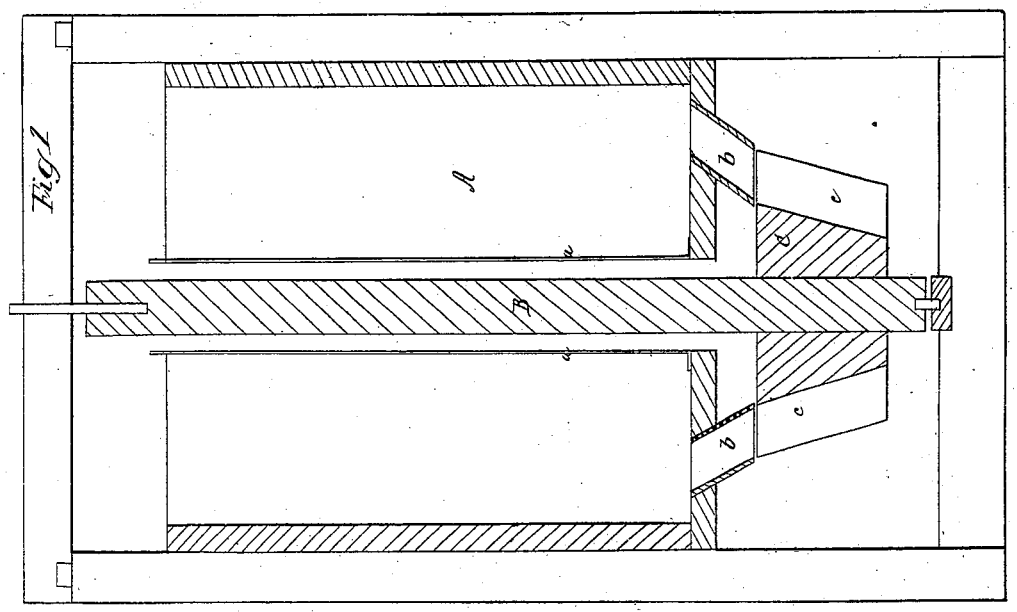

Fig. 1

UNITED STATES PATENT OFFICE.

JAMES DENISTON, OF LANIER, OHIO.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **4,471**, dated April 25, 1846.

To all whom it may concern:

Be it known that I, JAMES DENISTON, of Lanier township, in the county of Preble and State of Ohio, have invented a new and Improved Conical Percussion Water-Wheel; and I do hereby declare the following to be a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification.

To a fall of ten feet I would make a water-wheel five feet in diameter at the top, three and three-fourths of a foot at the bottom, and twenty-eight inches in depth, which I would secure to a vertical shaft.

I generally build my wheels as follows: I have a solid cone C, of wood, for their center and surround it at a suitable distance with a conical hoop D, constructed of staves confined by iron bands. Into the space between the cone and the hoop I secure the floats *c c* by fitting them into grooves in the solid cone and in the hoop. For a wheel of the above dimensions the floats should be nine inches wide at the top and seven inches at the bottom. The faces of the floats are of a concave form, their lower ends inclining forward, the vertical section of which should be about five inches below their upper ends. The curve of the floats should be such as to reach the bottom of the wheel at an angle of about fifteen degrees with the horizon. The inner edges of the floats should be the segments of circles about one-eighth larger than the outer edge of the same, for the purpose of preventing their winding and for bringing their front surfaces to a position at right angles with the chutes.

In the accompanying drawings, Figure 1 is a vertical section of a penstock with my improved conical wheel under the same as arranged for use. Fig. 2 is a perspective elevation of a water-wheel with a section of the outer rim or hoop broken out for the purpose of showing the form and arrangement of the floats *c c*.

A is the penstock, under which the wheel is placed. The shaft B of the water-wheel passes up through a water-tight tube or curb *a*, made fast to the bottom of the penstock, which extends above the water-line.

b b are the chutes which admit the water to the floats *c c* of the wheel through the floor of the penstock. Any number of chutes may be used at once that may be thought best. Instead of placing the chutes *b b* in a direction tangent with the circumference of the wheel, as is usually done, I place them in an oblique direction, pointing them inwardly toward that point at which the water is discharged from the wheel, as near as that point can be ascertained, so that the water will act in a straight line with the chute until the same is discharged.

In situations where there is a very high head of water and the required speed of the wheel is much slower than the speed of the water issuing from the chutes the greater should be the difference between the upper and lower diameters of the wheel, and in situations the reverse of this the wheel should taper less toward the bottom. In places subject to back-water there should be a water-tight casing surrounding the wheel made fast to the bottom of the penstock and open at the bottom. I would vary the height of my wheel to suit the head of water. For instance, for a head of water of ten feet I would build a wheel twenty-eight inches in height, and increase it where the head of water was greater than this and diminish it where it was less.

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

1. The combination of the cone, conical hoop, and curved floats, substantially of the form and in the manner herein set forth, for the purpose of forming a conical percussion water-wheel.

2. In combination with my improved water-wheel, the angle of inclination and peculiar arrangement of the water-chutes, for the purpose of producing the action of the water upon the wheel, substantially as herein set forth.

JAMES DENISTON.

Witnesses:
Z. C. ROBBINS,
THOS. H. BARLOW.