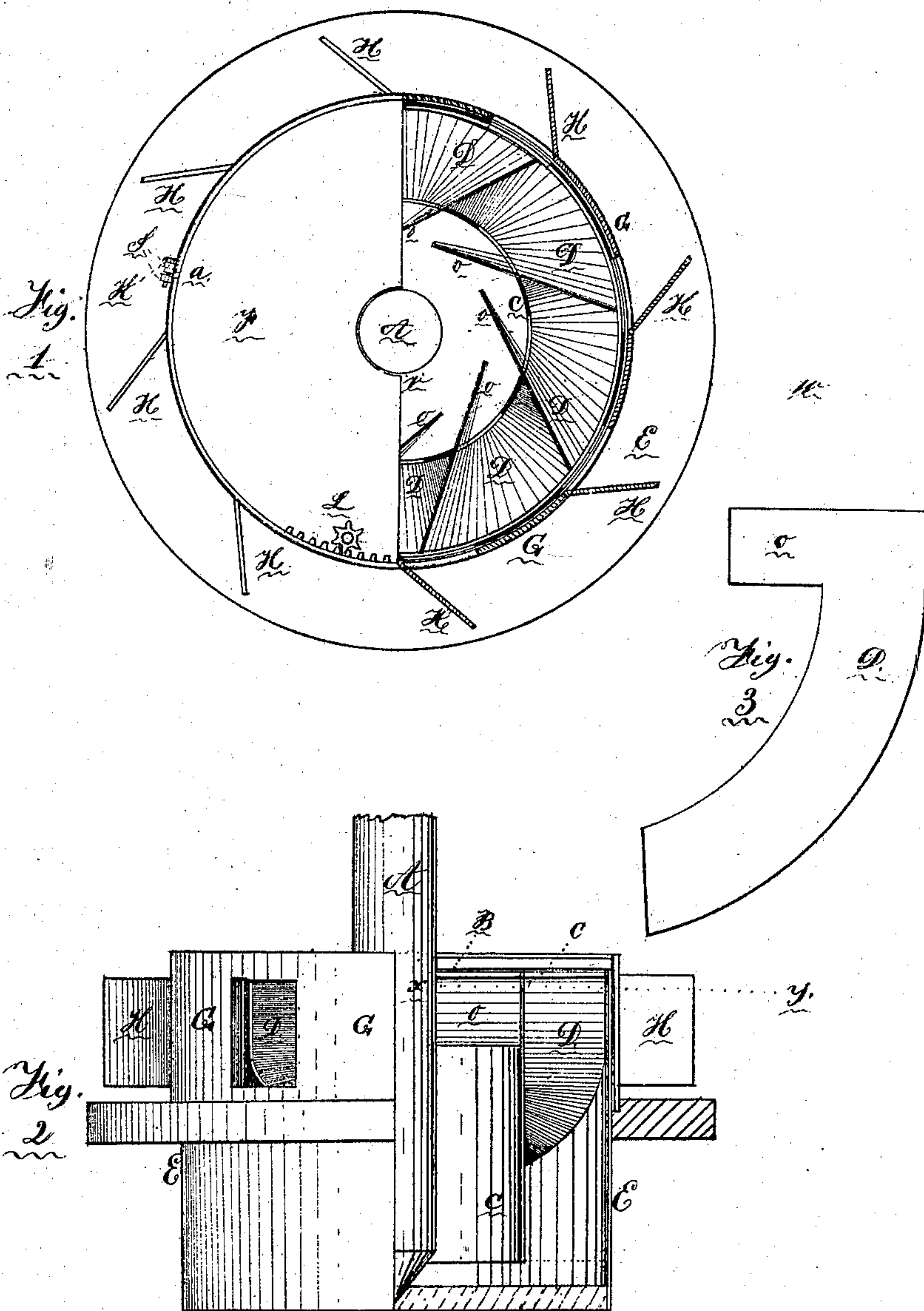


W. M. Wheeler,

Water Wheel.

No. 98,828,

Patented Jan. 11, 1870.



Witness,  
A. Greene,  
J. G. Arnold,

W. M. Wheeler Inventor

# United States Patent Office.

WILLARD M. WHEELER, OF BERLIN, MASSACHUSETTS.

Letters Patent No. 98,828, dated January 11, 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, WILLARD M. WHEELER, of Berlin, in the county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in the Construction of Water-Wheels and Gates; and I do hereby declare the following to be a full, clear, and exact description of the same, due reference being had to the accompanying drawings, making part of this specification.

In said drawings—

Figure 1 is a top view of my invention, with the right-hand half shown in section, taken at the line *x y* of fig. 2.

Figure 2 is a side view, with the right half shown in section, taken at the line *v w* of fig. 1, and

Figure 3 shows a form of bucket before being applied to the wheel.

The same letters indicate the same parts in each figure.

A is the shaft.

B, the top or cap of the wheel, made fast to the shaft, and supporting the rim or body C.

D D are the buckets, secured to the rim C and top B.

E is the curb, in which the wheel turns, and

F is the top of the same, with a bearing for the shaft A.

Through the upper part of E are the ports or water-ways, and the gate G plays around outside of E, and has corresponding ports with chutes H H H.

The gate G, I make with one or more joints *a*, having a pair of lips, I, and screw K, so arranged as to hold the parts a little separate, if desired, or to bring them close together, and thus adjust the fit and compensate for the wear, securing a tight gate. To give it motion, a rack and pinion, as at L, may be used.

The chutes H H H may be strengthened, if necessary, by bracing from the circular part of the gate, or by ribs or casing.

The wheel is in two parts, so to speak, one inside of the rim C, and the other outside; the wing *o* of the buckets (see fig. 3) passing through or projecting from C, as shown in figs. 1 and 2, and forming the in-

side part, and the remainder of the bucket is attached outside of C, the upper portion being perpendicular to the depth of the wing *o*, or thereabout, and thence it turns to a spiral of decreasing pitch, and extends around C, so as to make the discharge at its end about six-tenths of a port or gate-opening, the upper edge of bucket being set at the angle shown in fig. 1, or thereabout, the rim C having ports for each wing about one-half size of the others, but which vary with size of wheel and head of water, in relation to speed. The other parts may be of any convenient form, to agree with the surroundings of each, and, therefore, may vary according to circumstances.

The operation is simple and plain. When the gates are turned to open only a little, the water, guided by the chutes, enters unbroken against the buckets, and falls to the lower part, expending its full power and weight, and when the gate is fully open, the water passes both down the outside of C, and also through its ports, and acts on the wings, and falling inside, the water, being divided, is not checked, only sufficient to obtain all its force and efficiency.

I am aware that wheels have been made in two parts, and also with double buckets, and that gates are frequently operated by a rack and pinion. These I do not claim.

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

1. The bucket D, spirally curved, and of varying pitch, with the interior wing *o*, in connection with the cylinder C, having ports or water-ways through it, and a discharge both outside and inside of its base, the whole being constructed to operate substantially as described.

2. The revolving cylindrical gate G, having fixed chutes attached to and projecting obliquely from the edges of its ports, when constructed and arranged to operate substantially as herein specified.

W. M. WHEELER.

Witnesses:

A. GREENE,

JAS. G. ARNOLD.