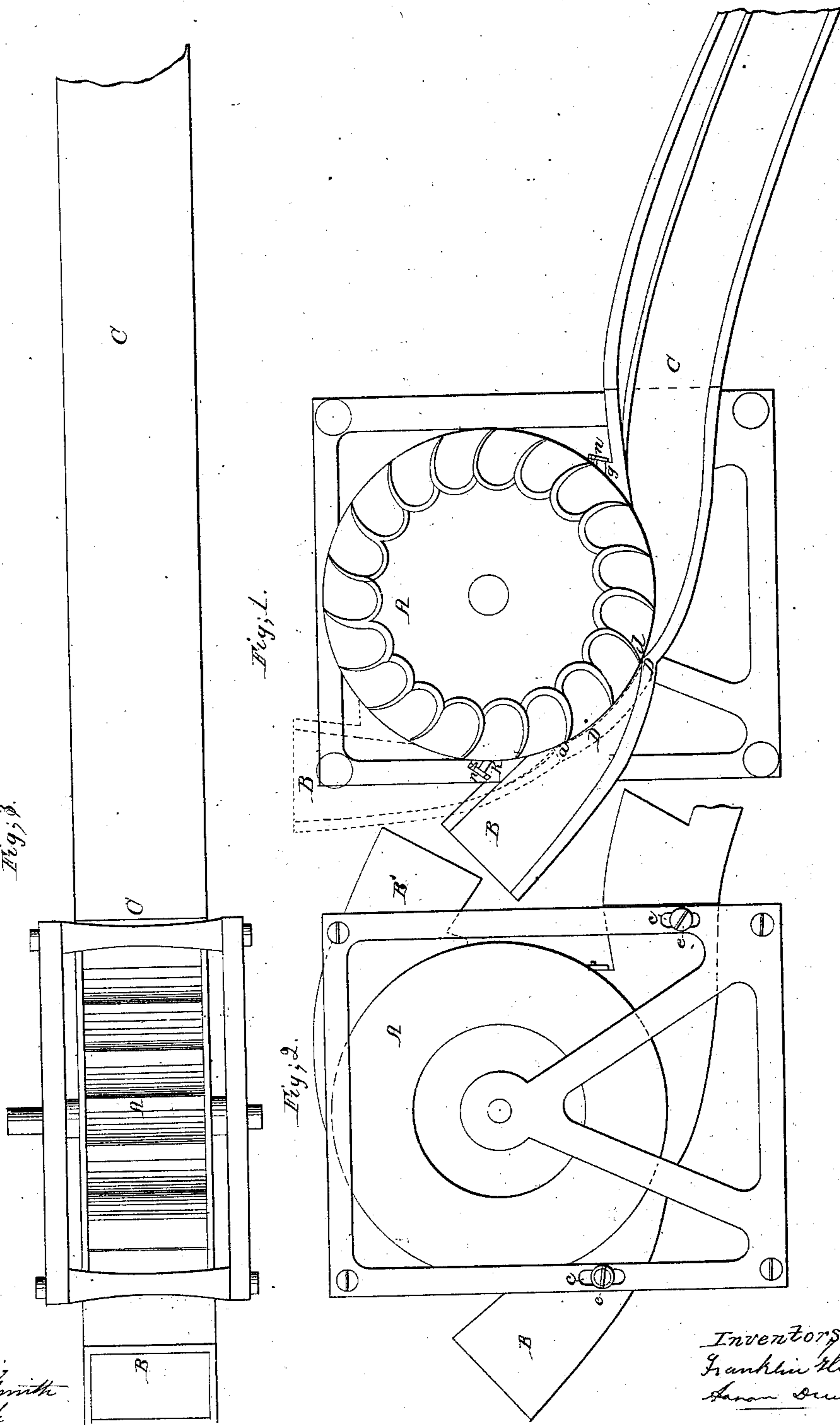


*Hoyt & Denio,*

*Water Wheel,*

*N<sup>o</sup> 80,178*

*Patented July 21, 1868.*



*Witnesses;  
Oramel Holmuth  
Ed. Birch*

*Inventors;  
Franklin Hoyt  
Aaron Denio*

# United States Patent Office.

FRANKLIN HOYT AND AARON DENIO, OF MONTPELIER, VERMONT.

*Letters Patent No. 80,178, dated July 21, 1868.*

## 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 we, FRANKLIN HOYT and AARON DENIO, both of Montpelier, in the county of Washington, and State of Vermont, have invented certain new and useful Improvements in Applying and Controlling the Action of Water on Water-Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a longitudinal vertical sectional elevation,

Figure 2 a side, and

Figure 3 a top view, all as applied to a wheel on a horizontal shaft, or to a horizontal wheel.

In this invention, the wheel A may be any well-constructed wheel, and the buckets may be curved and intersect each other, as shown, or in any other form upon which water can act to advantage; but, to obtain the best results from the action of the water, we employ an inlet-chute, B, and an outlet-chute, C, combined, and applied to the periphery of the wheel in reversed positions, as shown in fig. 1, where it will be observed that the terminus of the curved chutes, or the central portion, D, thereof, is brought so near the periphery of the wheel that no great quantity of water can pass between the wheel and the portion D of the combined chutes without turning the wheel.

It is not always necessary that the inlet-chute B should be applied so low down as shown in fig. 2, or as shown in black lines in fig. 1, but such inlet-chute may be arranged higher, as shown in red lines in fig. 1, and, in the latter case, the portion D of the combined chutes may be longer and cover more surface, and retain water in the buckets while they are passing from *a* to *d*, producing the same effect as in the breast-wheel, where the weight, as well as the force of water, is made available.

In this invention, the reversed chute C conducts the water from the wheel in a solid column, and, by extending the last-named chute down the stream a greater or less distance, the column of water in the chute C, so extended, will act in connection with the water passing in at the chute B, by drawing or sucking on the lower buckets, and the water passing the portion D and in the buckets, and the intensity of such sucking action will be in proportion to the elevation of the extended chute and the perfection of the column of water therein, or passing through the same.

These double-reversed chutes, with the outlet-chute extending down the stream, are intended to be used where the head of water is insufficient to obtain the amount of power required, and, in such cases, the sucking action of the column of water in the extended chute will aid considerably in multiplying or increasing the effective power of the wheel.

The same law holds good where the head of water is ample, but the extended chute will be of greater importance where the head and the quantity of water are limited.

The double-reversed chutes, and the chute C extended, and both applied as shown in black lines in figs. 1 and 2, render the wheel available where there is only a temporary dam, or at the side of a stream, brook, or river, where there is no dam, and power obtained from the action of the water after it has passed the buckets of the wheel and the portion D of the combined chutes, as well as while in contact with the wheel.

The vent-hole *k*, above the chute B, is to admit air to the buckets, or to free the buckets from air, which may be necessary to insure an easy action of the water in filling and emptying the buckets. The vent-hole *g*, above the chute C, is for the same purpose.

Either of these vent-holes may be closed, or partly closed, by a cover, *n*, arranged for that purpose, and the currents of air passing through such vent-holes can be regulated as desired.

The combined chutes are made adjustable to the periphery of the wheel (to which they are closely fitted) by means of slots *c*, in some portion of the frame which supports the wheel and the chutes, and by bolts or screws *e* passing through the parts, to hold them firmly together.

Our improvements can be applied to vertical wheels as well as to horizontal wheels, and when applied to a vertical wheel, the extra chute, B<sup>1</sup>, may be applied to the opposite side of the wheel, (as shown in fig. 2,) and

thereby obtain additional power, independent of the draught or suction, admitting of the application of two gates to the wheel.

Having fully described our new invention, what we claim as new, and desire to secure by Letters Patent, is—

The adjustable inlet-chute B and the extended outlet-chute C, provided with regulating-vents *k g*, and arranged in relation to each other, and to the wheel A, substantially as described, for the purpose specified.

FRANKLIN HOYT,  
AARON DENIO.

Witnesses:

ORAMEL H. SMITH,  
JOEL WINCH.