J. P. DROUILLARD.
Flumes for Water-Wheel.

No. 199,274. Patented Jan. 15, 1878.

Fig. 1.

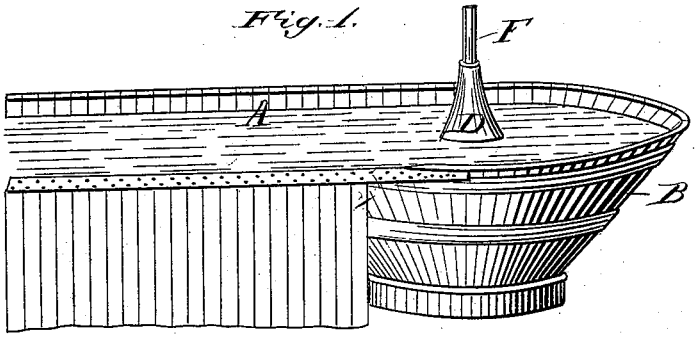


Fig. 4.

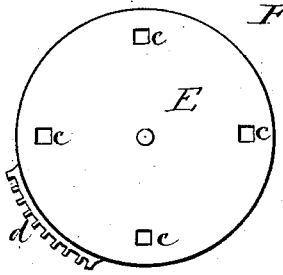


Fig. 5.

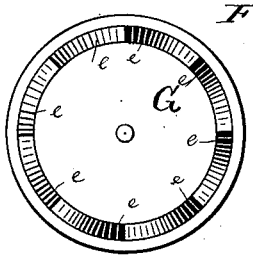


Fig. 3.

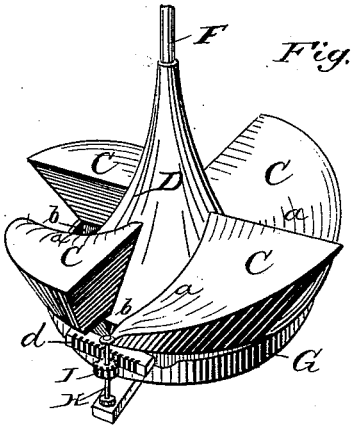
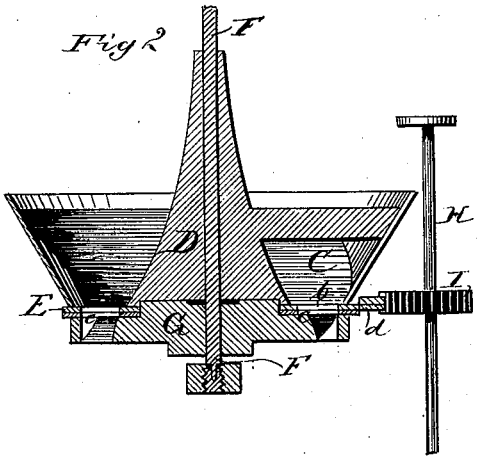


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES P. DROUILLARD, OF GREENVILLE, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO ALEXANDER GLEASON, OF SAME PLACE.

IMPROVEMENT IN FLUMES FOR WATER-WHEELS.

Specification forming part of Letters Patent No. **199,274**, dated January 15, 1878; application filed November 19, 1877.

To all whom it may concern:

Be it known that I, JAMES P. DROUILLARD, of Greenville, in the county of Montcalm and State of Michigan, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to vertical water-wheels or turbines; and it consists in an improved construction and arrangement of parts, substantially as hereinafter more fully described.

In the drawing, Figure 1 is a perspective view of a portion of a flume provided with my improved water-wheel. Fig. 2 is an axial section. Fig. 3 is a perspective view of the cone, conductors, and wheel, with the exterior covering or casing removed. Fig. 4 is a plan view of the gate-plate, and Fig. 5 is a similar view of the bucket-plate or wheel.

Similar letters of reference indicate corresponding parts in all the figures.

A is the flume, which terminates in a conical chamber or casing, B. To the inner walls of chamber B are rigidly secured the chutes or conveyers C, which abut against the central cone D, so as to form inclined water-passages *a a*, which terminate in openings *b b*, just above the gate-plate E. This consists of a circular disk having openings *c*, corresponding in numbers and dimensions to the water-gates *b*, and provided with a segmental rack or gear-section, *d*.

Plate E is pivoted on the central shaft F, between the bottom of casing B and the horizontal wheel or bucket-plate G, which latter is arranged below the opening in casing B, and firmly keyed to the shaft F.

The rim of wheel G has a series of circumferential buckets, (denoted by *e*,) of a width corresponding to the width of the water-passages *b* and openings *c* in the gate-plate. Each of these buckets forms a segment of a wheel, G, and is inclined in the direction opposite to that of the conveyers C.

From the foregoing description, taken in connection with the drawing, the operation of my improved turbine or water-wheel will be readily understood. The water, passing through the flume into the conical case B, is conducted by the inclined conveyers C against the passages *b*, and, through the openings *c* in the gate-plate, down into the inclined buckets of the wheel G below, thereby causing this to rotate in the direction of the arrow, and with it shaft F, which projects up through the stationary cone D, and has a gear-wheel or belt-drum secured to the top, by means of which the power is transmitted to the machinery of the mill. By turning gate-plate E, (which is done by means of shaft H and pinion I, which engages with the segmental rack *d*, and is operated by a wheel or lever secured to the top of the shaft, either above the water-line or on the outside of the wheel-casing, so as to be readily accessible,) the flow of water to the buckets may be regulated or entirely shut off, at will.

The advantages of my improved water-wheel are, among others, the following: Great simplicity and durability of construction; great power, owing to the conical shape of casing B, which, with its interior conveyers C, conducts the water down into the buckets, and which allows a large body of water to exert pressure on the buckets at one time; and the ease with which the flow of water is regulated or shut off, owing to the fact that only the narrow edge of the openings in the gate-plate has to cut the stream of water to control or stop the flow.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In combination with a horizontal bucket-wheel, a conical chute or water-conveyer, consisting of the following parts: an exterior conical casing, B, interior cone D, and conductors C, whereby a series of inclined water-passages, *a*, are formed, terminating in openings *b*, substantially as and for the purpose hereinbefore set forth.

2. The combination of the conical chute or conveyer B C D, whereby a series of inclined water-passages, *a b*, are formed, with the gate-plate E, having openings *c* and segmental rack *d*, substantially as and for the purpose hereinbefore set forth.

3. The combination of the conical chute or conveyer B C D, gate-plate E, and horizontal bucket-wheel G, substantially as and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES P. DROUILLARD.

Witnesses:
J. H. TATEM,
PETER SPANOYLE.