J. M. DENSON.

Turbine Water-Wheel.

No. 164,724. Patented June 22, 1875.

Fig: 1.

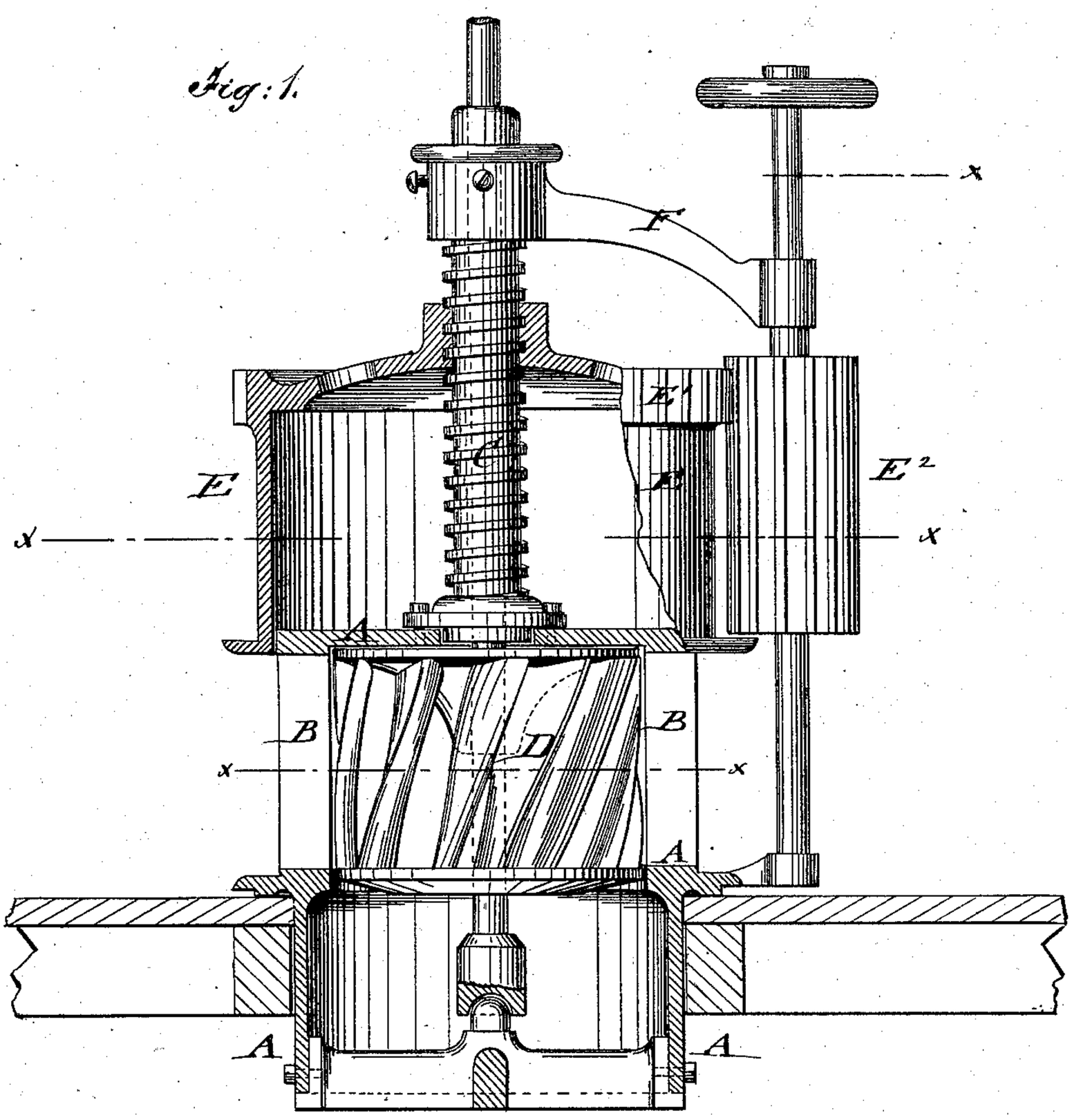
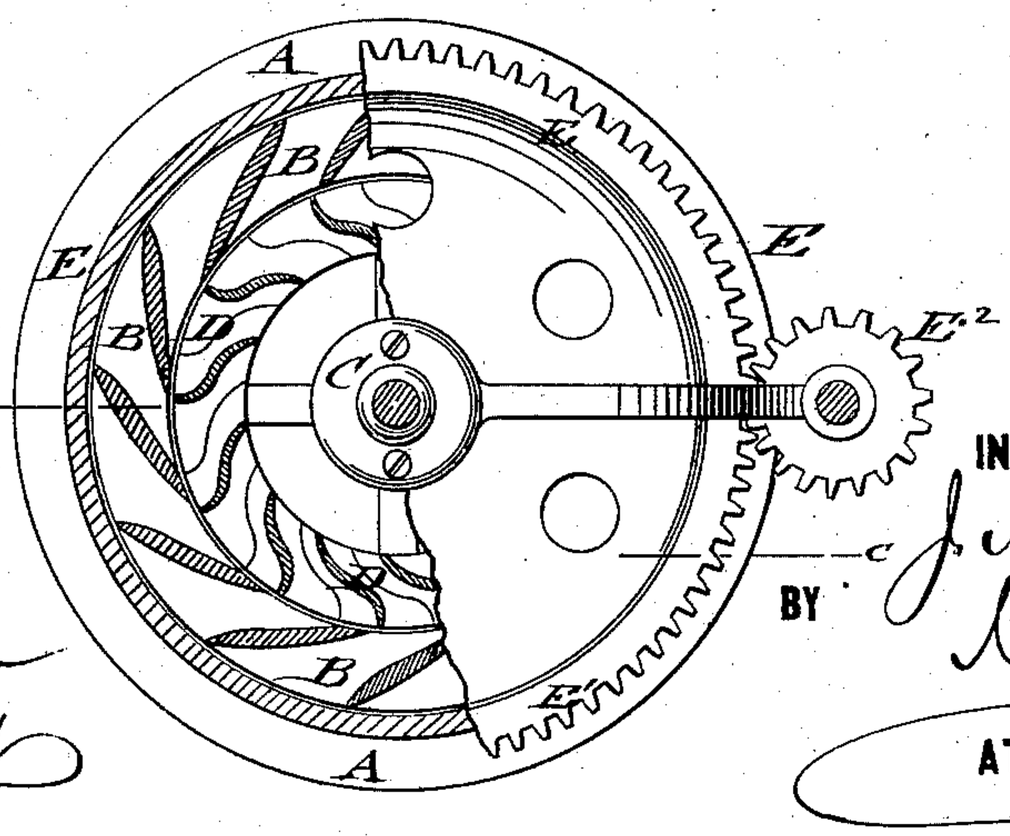


Fig: 2.



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UNITED STATES PATENT OFFICE.

JAMES M. DENSON, OF COLUMBUS, GEORGIA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **164,724**, dated June 22, 1875; application filed April 9, 1875.

To all whom it may concern:

Be it known that I, JAMES M. DENSON, of Columbus, in the county of Muscogee and State of Georgia, have invented a new and Improved Turbine Water-Wheel, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation, partly in section, on the line *c c*, Fig. 2, of my improved turbine water-wheel; and Fig. 2, a plan view of the same, partly in horizontal section, on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The invention will first be fully described in connection with drawing, and then pointed out in the claims.

In the drawing, A represents the wheel-case made in one casting with the fixed chutes or water-ways B. C is a hollow cylindrical column with outer screw-thread through which the shaft of the turbine-wheel D passes. The wheel D is provided with the same number of buckets as there are chutes or water-ways in the wheel-case, the angle of inclination of the buckets being determined by the depth or height of the same, and the distance from point to point between the vertical chutes. This arrangement of the buckets secures the delivery of water through two diametrically-opposite buckets at the same time, and as the buckets enter successively the flowing column of water and receive the impact of the same, the jarring or vibratory motion of the wheel resulting from the entering at full depth is avoided, and a steady and uniform motion imparted to the same. The gate E is made of cylindrical shape, covering the entire wheel and wheel-case to a point below the chutes, and moves by an internally-threaded hub on the hollow screw-column C. An outer gearing E^1 of the gate E meshes with an actuating-pinion, E^2, of equal height, whose shaft turns in bearings of the casing and of a top arm, F, attached to the end of column C. The gate may thereby be raised or lowered to any desired height along the wheel, according to the power required.

In place of the revolving gate traveling on a stationary screw-column, the gate may be made to slide vertically on a column revolved by suitable gearing, or any other gearing device for raising or lowering the gate may be employed, as I do not confine myself to the one shown in the drawing.

By the vertical adjustment of the gate the pressure of water on the same will be greatly reduced, while absolute security against leakage is maintained.

By the small amount of machine work and fitting required the wheel may be more cheaply constructed than most of the iron turbine-wheels.

As the cross-section of the chutes remain always the same, whether full or partial gate be used, the power of the water will be more effectually utilized than in wheels using annular or hinged gates which swing horizontally for partial gates.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A turbine water-wheel provided with a rotary upwardly-movable gate, inclosing and covering the chutes or water-ways, substantially as shown and described.

2. The combination, with gate E, having circumferential spur-wheel E^1, and adjustable on a central screw, C, of a hand-shaft provided with pinion E^2, as and for the purpose specified.

JAMES M. DENSON.

Witnesses:
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