

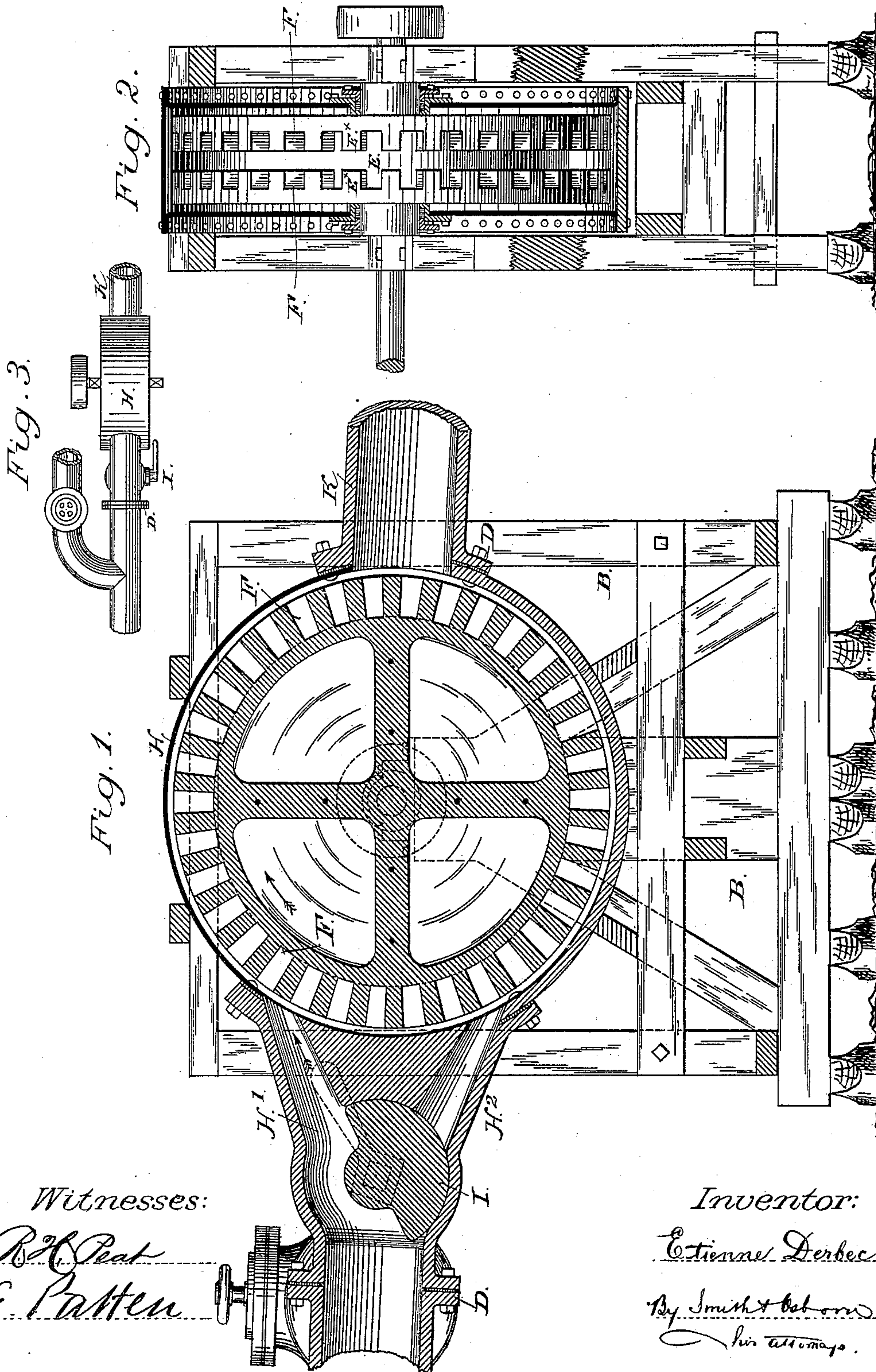
(No Model.)

2 Sheets—Sheet 1.

E. DERBEC.  
WATER WHEEL.

No. 397,071.

Patented Jan. 29, 1889.





(No Model.)

2 Sheets—Sheet 2.

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WATER WHEEL.

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Fig. 5.

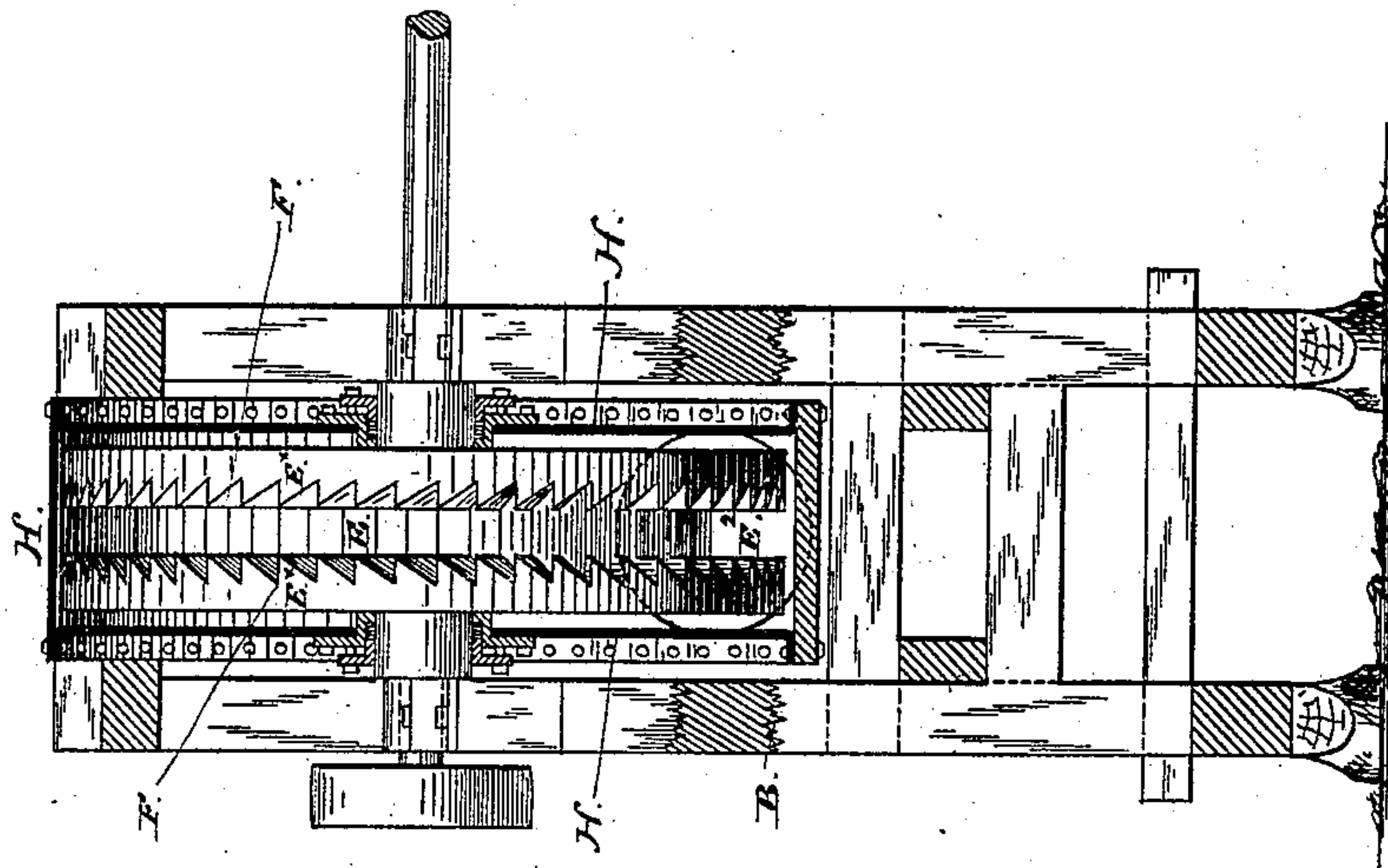
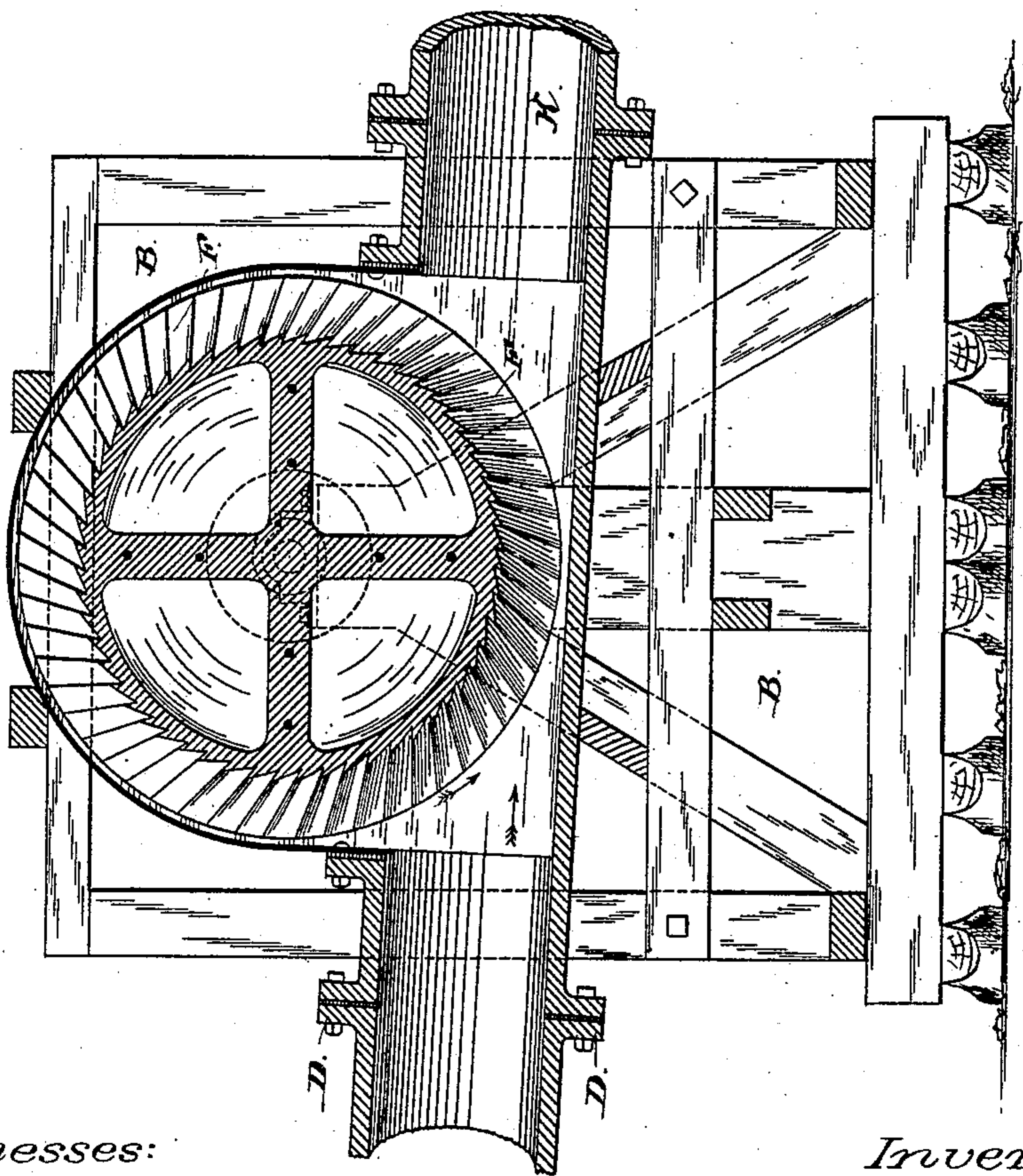


Fig. 4.



Witnesses:

*R. H. Peat.*  
*E. Patten.*

Inventor:

*Etienne Derbec*  
*By Smith & Brown*  
*his attorney*



# UNITED STATES PATENT OFFICE.

ETIENNE DERBEC, OF SAN FRANCISCO, CALIFORNIA.

## WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 397,071, dated January 29, 1889.

Application filed January 27, 1888. Serial No. 262,181. (No model.)

*To all whom it may concern:*

Be it known that I, ETIENNE DERBEC, of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Water-Wheels, of which the following is a specification.

My invention relates especially to water-wheels employed in hydraulic mining where the motive power is derived from pipes or mains under great pressure in which the wheel is set; and my present invention is embraced in a line or system of apparatus mainly adapted to such hydraulic mining, for which I have already applied for Letters Patent of the United States, Serial No. 254,710, filed November 8, 1887.

To attain this end my invention consists in constructing the wheel with an annular channel or way in its periphery that is rectangular in cross-section, and on the sides or faces of which, at suitable distance apart, the stops or buckets are formed. By this construction the wheels have counterpart openings and buckets upon each side of the channel, and the area of the contacting surface of the water when driven against the buckets is considerably increased. The wheel is inclosed in a water-tight casing, which is in a hydraulic main or pipe in position to bring the run of the wheel into the pipe.

In the accompanying drawings, forming a part of this specification, Figure 1 is a longitudinal section taken vertically through the wheel-casing, pipes, and frame. Fig. 2 is an end elevation with the casing in cross-section. Fig. 3 is a top view, on a smaller scale, of the wheel in position for operation. Figs. 4 and 5 are views of a construction of wheel intended to run in one direction, Fig. 4 being a longitudinal section, and Fig. 5 a cross-section.

That portion of the hydraulic main or pipe which I employ is mounted upon a suitable frame, B, and a portion is cut away to receive the water-tight casing C, which incloses the water-wheel. This casing is made of sufficient strength to sustain the great pressure of the water-main, and the section employed is bolted to the adjacent sections by bolts passing through the abutting flanges D. The wheel is best formed of three parts, of which one is the center disk, E, and the others are

the two outer disks, E<sup>x</sup> E<sup>x</sup>. The middle one is smaller in diameter than the outside disks, so that when three parts are laid together the rectangular channel or water-way E<sup>2</sup> is produced.

On the inner faces of the two parts E<sup>x</sup> E<sup>x</sup> are formed the buckets F F. These are either of rectangular shape, as shown in Figs. 1 and 2, or they are made angular like the teeth of a saw, but moved acute, with the points setting against the current, as shown in Figs. 4 and 5. This last construction is well adapted for wheels that are run always in one direction without reversing, while the other construction is intended to allow the water to be directed either under or over the wheel to change the direction of movement accordingly.

It should be noticed that this wheel could be cast in one piece instead of being made in parts, as I have already described, as in this particular the construction will be governed by the size of the wheel. In order to provide for reversing the motion of the wheel, the casing H, Figs. 1 and 2, is constructed to surround the rim of the wheel, and the inlet at the pressure side is divided into two diverging branches, H' and H<sup>2</sup>, one of which connects with the casing below the center of the wheel and the other with the casing above the center. These branches divide the hydraulic pipe at the pressure side into two passages, either of which is brought into use by a gate, I, that is set in the pipe at the point of divergence of the branches, and is connected with a shaft or rod leading through the pipe to the outside for throwing the gate to one side or the other. By this means the motion of the wheel can be instantaneously changed from a forward to a reverse movement or from an undershot to an overshot wheel, or by turning the gate around to its seat the whole of the water-supply is stopped and the wheel is made to stand still. In this construction, as well as that described in Fig. 4, the water, after having passed through the wheel, will flow on in the main K to supply other motors or for washing gravel.

In the operation the water from the main passing through the channel or water-way in the rim of the wheel impinges against the

buckets and rotates it in one direction, as shown in Fig. 1, or in the other direction when the main is branched, as in Fig. 2. The buckets opening endwise into the peripheral channel or water-way give a great impact-surface for the water, and at the same time the said channel or water-way permits the buckets to be more quickly freed from the water, so that no lost power is experienced, as would be the case in an inclosed wheel having the ordinary buckets.

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

A water-wheel having a peripheral water-way or channel and buckets on each side of and opening laterally into said water-way or channel and outwardly on the periphery of the wheel, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ETIENNE DERBEC. [L. S.]

Witnesses:

C. W. M. SMITH,  
CHAS. E. KELLY.