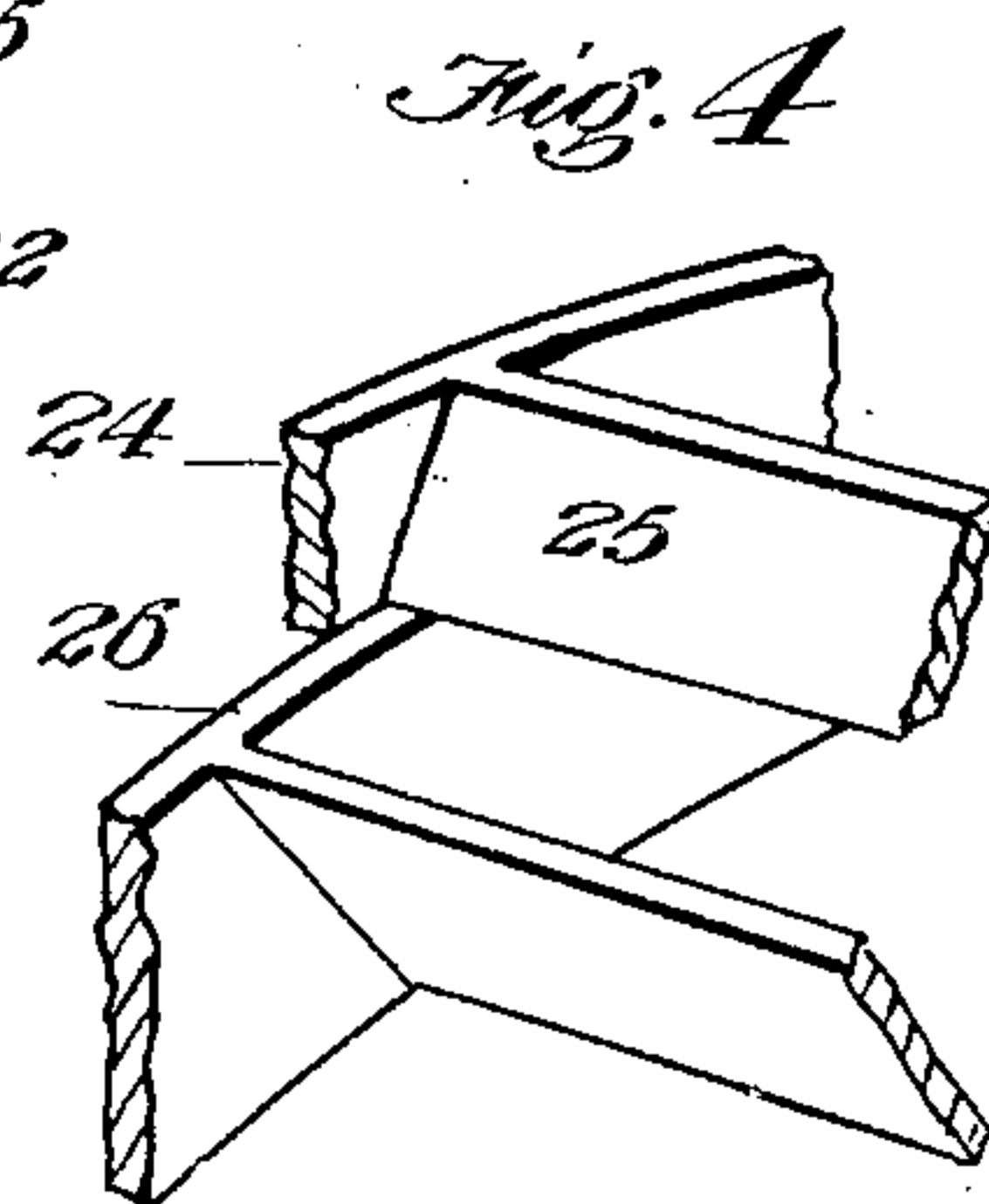
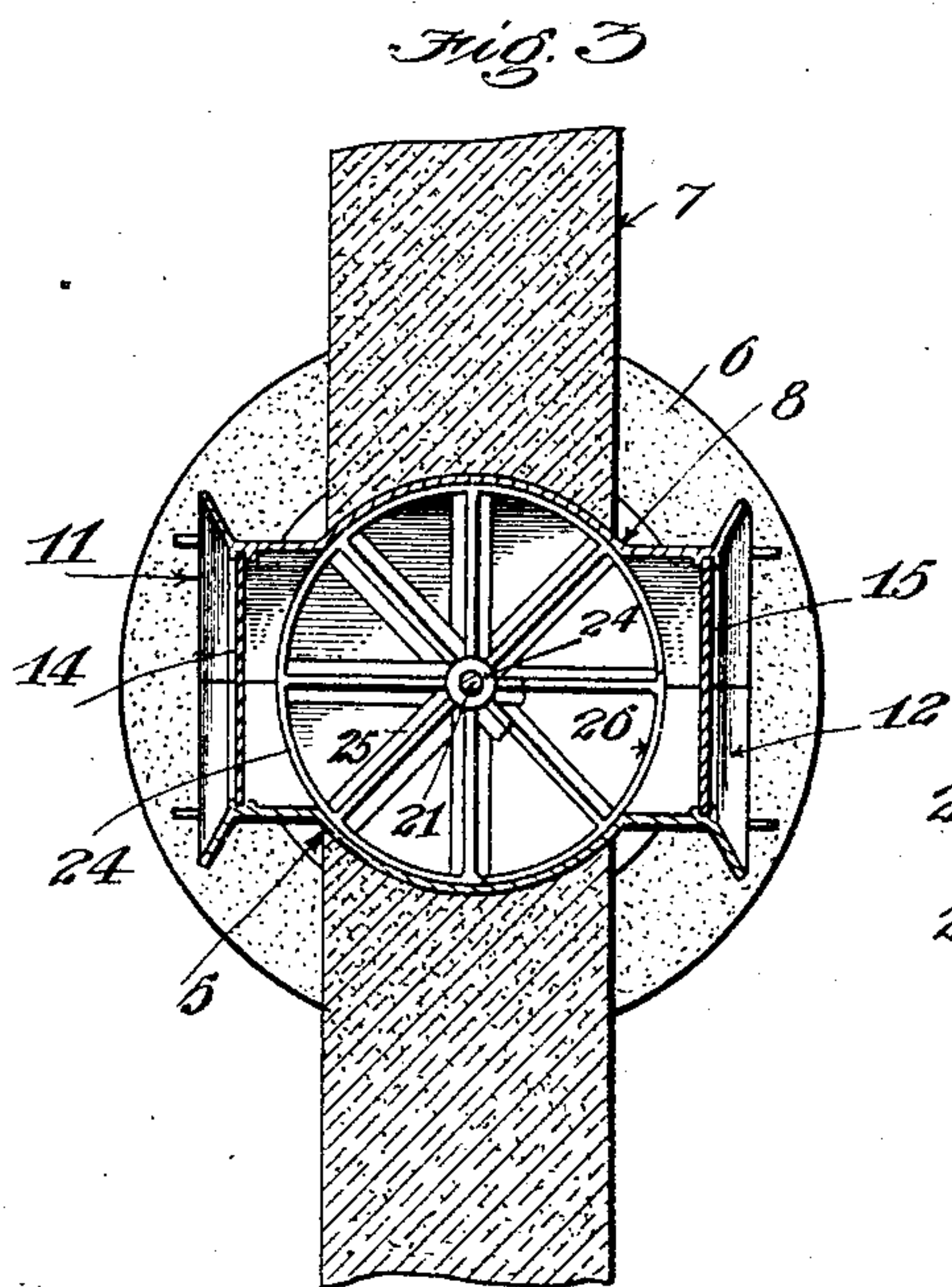
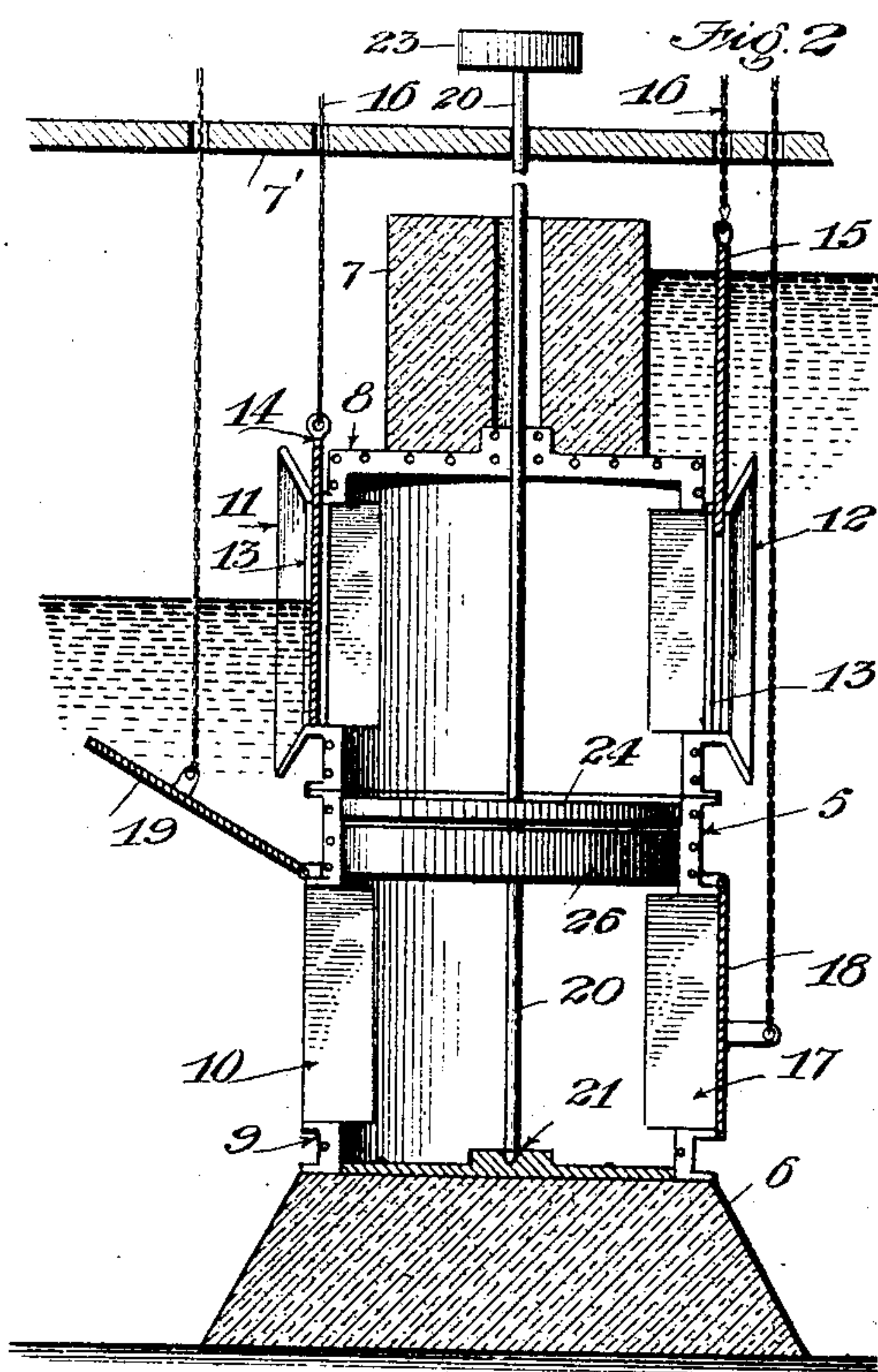
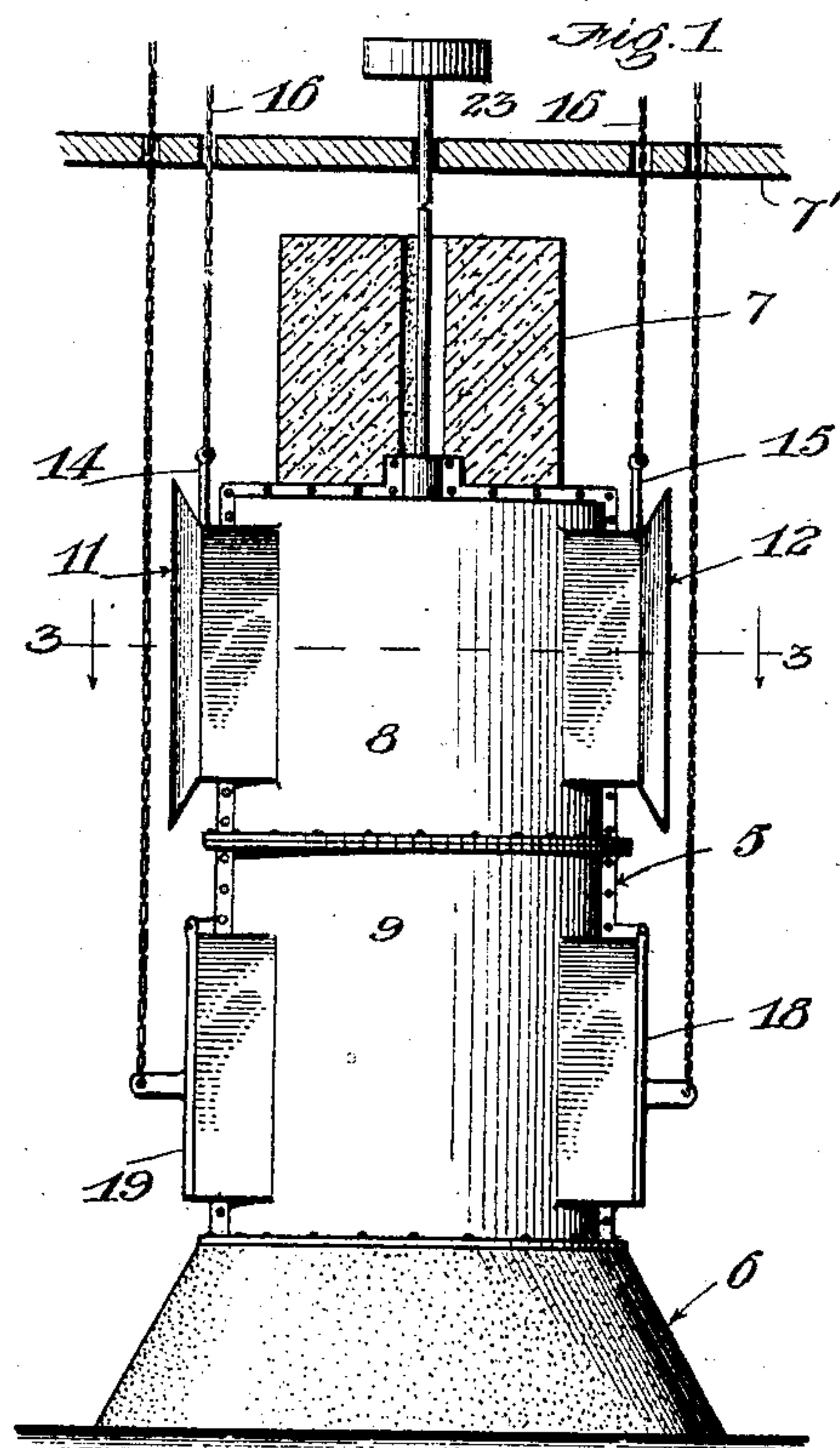


No. 785,879.

PATENTED MAR. 28, 1905.

G. M. HELVIE.
TIDE MOTOR.

APPLICATION FILED OCT. 31, 1904.



Witnesses

Edmund A. France

Myrtle Jones

by

Inventor
George M. Helvie
Hazard & Warpham
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE M. HELVIE, OF LONGBEACH, CALIFORNIA.

TIDE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 785,879, dated March 28, 1905.

Application filed October 31, 1904. Serial No. 230,874.

To all whom it may concern:

Be it known that I, GEORGE M. HELVIE, a citizen of the United States, residing at Longbeach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Tide-Motors, of which the following is a specification.

My invention relates to mechanism by means of which the ebb and flow of the tide is utilized to operate water-wheels to generate power; and the object thereof is to provide simple and efficient means to obtain power from the rise and fall of the tide. I attain these objects by the device described herein and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my motor, the retaining-wall and wharf being in section. Fig. 2 is a central vertical section of my motor in operation. Fig. 3 is a cross-section on line 3 3 of Fig. 1. Fig. 4 is a fragmentary perspective of my deflector and water-wheel.

In the drawings, 5 is a hollow cylindrical shell closed at both ends and mounted on a suitable footing 6, which forms a part of a retaining wall or dam 7, over which is constructed a wharf or pier 7'. This shell is divided into upper and lower sections 8 and 9 for greater convenience in casting and assembling, after which they are firmly bolted together. In the upper half of this shell I provide inlet-openings 11 and 12, diametrically opposite each other and having flaring mouths to deflect a greater volume of water to the inlets. Mounted in suitable guides 13 and controlling the ingress water to these inlets are water-gates 14 and 15, operated by suitable means, such as chains 16, secured to the wharf. Directly under and in line with the inlet-openings and in the lower half on this shell I provide discharge-outlets 10 and 17, having hinged gates 18 and 19, which are operated by the pressure of the water against them, but may be controlled, as shown in this instance, by chains or other mechanically-operated means. Mounted in this shell is a shaft 20, whose inner end is secured in a step-bearing 21 and whose outer end passes through a bearing 22 in the upper end of the shell and has secured to it a pulley 23 of usual con-

struction, from which power is taken. Mounted about midway in the shell and secured thereto at a suitable distance below the inlet-openings to provide for a sufficient fall for the water to the wheel is a deflector 24, from whose hub are radial deflector-blades 25, arranged at an angle to deliver the water with a greater force to water-wheel 26 of any suitable construction, preferably a turbine-wheel.

The operation of my device is as follows: Assuming it is high tide and the water has begun to recede at the left of the dam, Fig. 2, the inlet-gate 14 and the outlet-gate 18 are then closed and the inlet-gate 15 and outlet-gate 19 are opened. The water flowing in the inlet 15 falls with great force and rapidity on the deflector 24, which in turn delivers it to the water-wheel, driving it around with great force, and thereby imparting motion to the shaft 20, which drives the pulley, and the water passes out of outlet 10. When the tide begins to flow in the opposite direction, the reverse arrangement of the gates is made. It will thus be seen that I have provided a motor extremely simple in construction, highly efficient in operation, and one that can be adapted to the changes of the tides. If so desired, a number of motors may be placed in the retaining-wall or may be placed in separate walls that jut outwardly in the stream or river, and it is obvious that various changes may be made in my construction without departing from the spirit of my invention.

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

1. A retaining-wall; a hollow cylinder mounted in said wall; said cylinder having a plurality of inlet and outlet openings; means for controlling said openings; a shaft mounted in said cylinder and a revoluble water-wheel secured to said shaft intermediate the inlets and outlets.

2. A retaining-wall; a hollow cylinder mounted in said wall; said cylinder having a plurality of inlet and outlet openings; means for controlling said openings; a shaft mounted in said cylinder and a revoluble water-wheel secured to said shaft intermediate the

inlets and outlets; a deflector secured in said cylinder above and adjacent said water-wheel.

3. In a retaining-wall; a hollow body mounted in said wall; said hollow body having a plurality of oppositely-disposed inlet and outlet openings; means for controlling said openings; a deflector secured in said body intermediate said inlets and outlets; a shaft revolvably mounted in said body and a revoluble water-wheel secured to said shaft below and adjacent said deflector.

4. In a dam to control the flow of tides; a plurality of inlet and outlet openings in said

structure; means to control said openings; a deflector secured in said structure intermediate said inlets and outlets; a shaft revolvably mounted in said structure and a revoluble water-wheel secured to said shaft below and adjacent said deflector.

In witness that I claim the foregoing I have hereunto subscribed my name this 10th day of October, 1904.

GEORGE M. HELVIE.

Witnesses:

G. E. HARPAM,
EDMUND A. STRAUSE.