

No. 630,482.

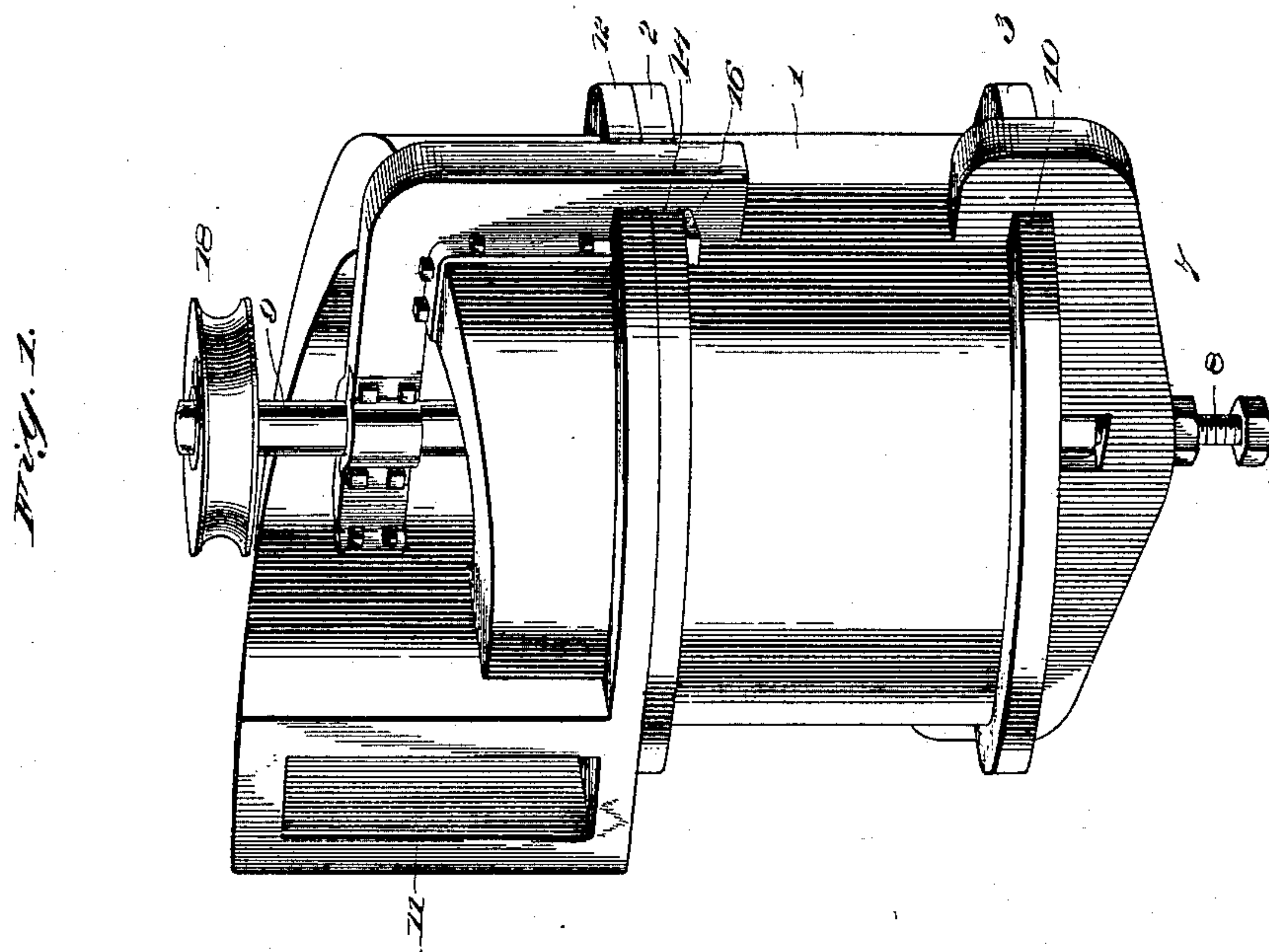
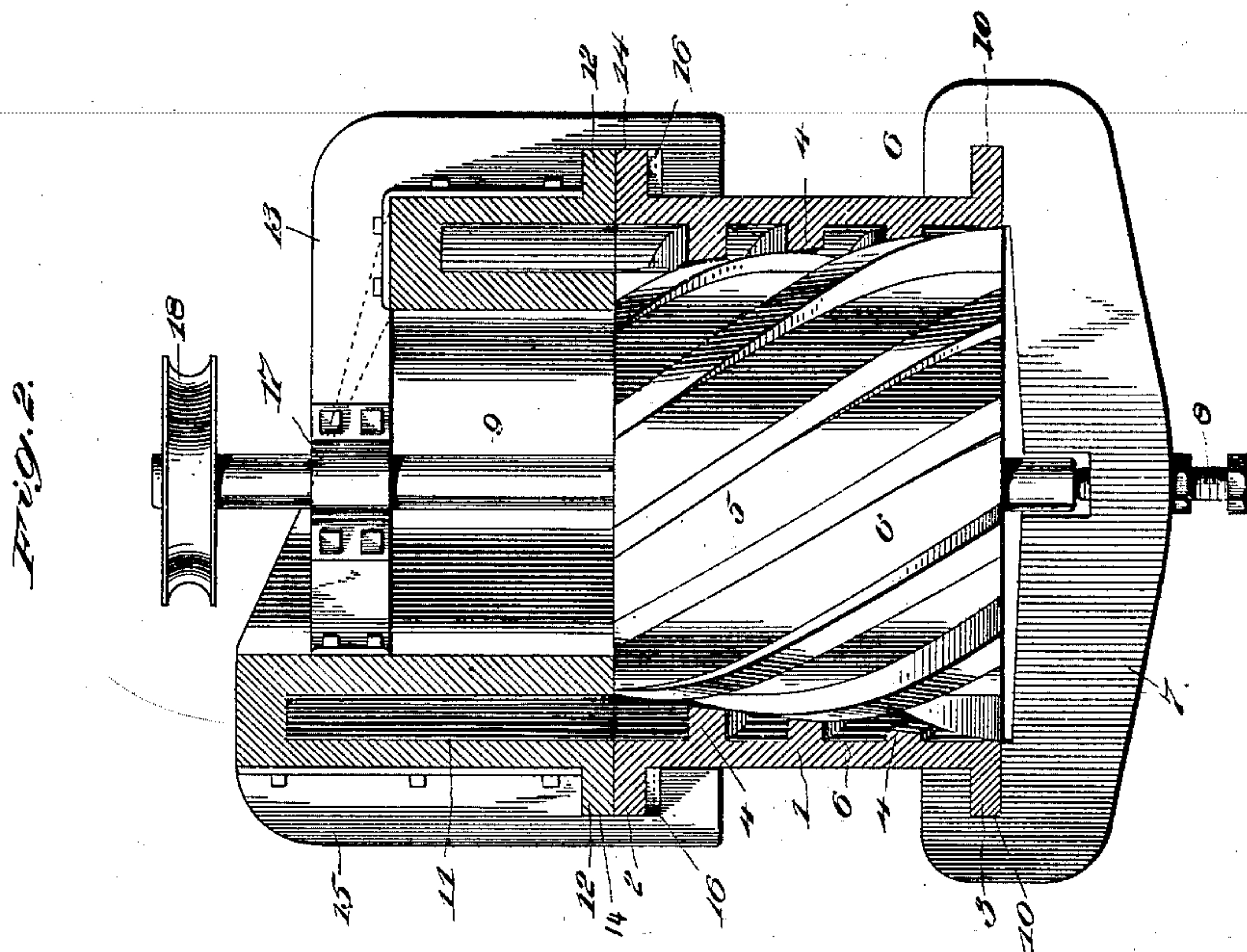
Patented Aug. 8, 1899.

C. BRIMER.
TURBINE WATER WHEEL.

(Application filed June 11, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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2 Sheets—Sheet 2.

Fig. 4.

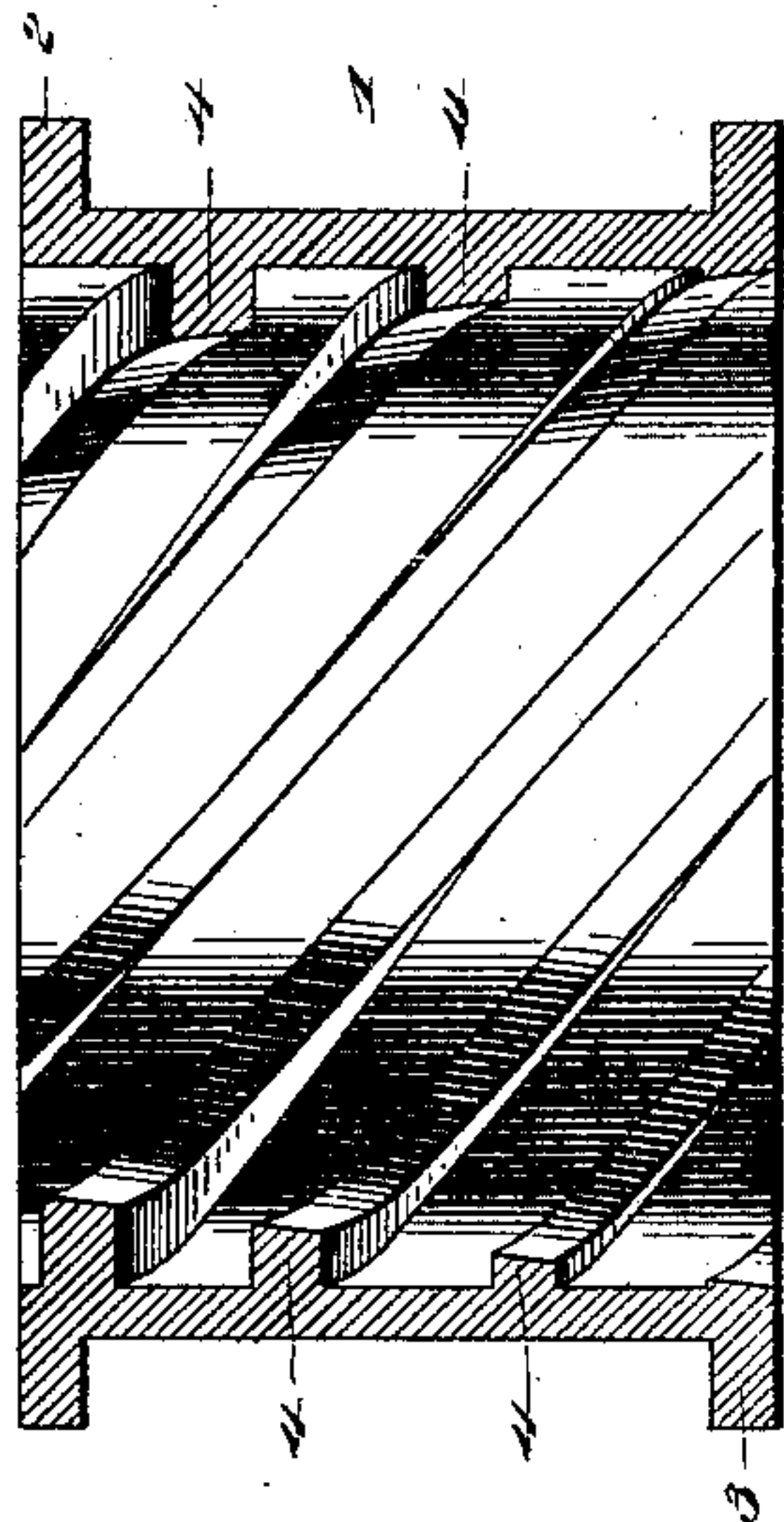


Fig. 5.

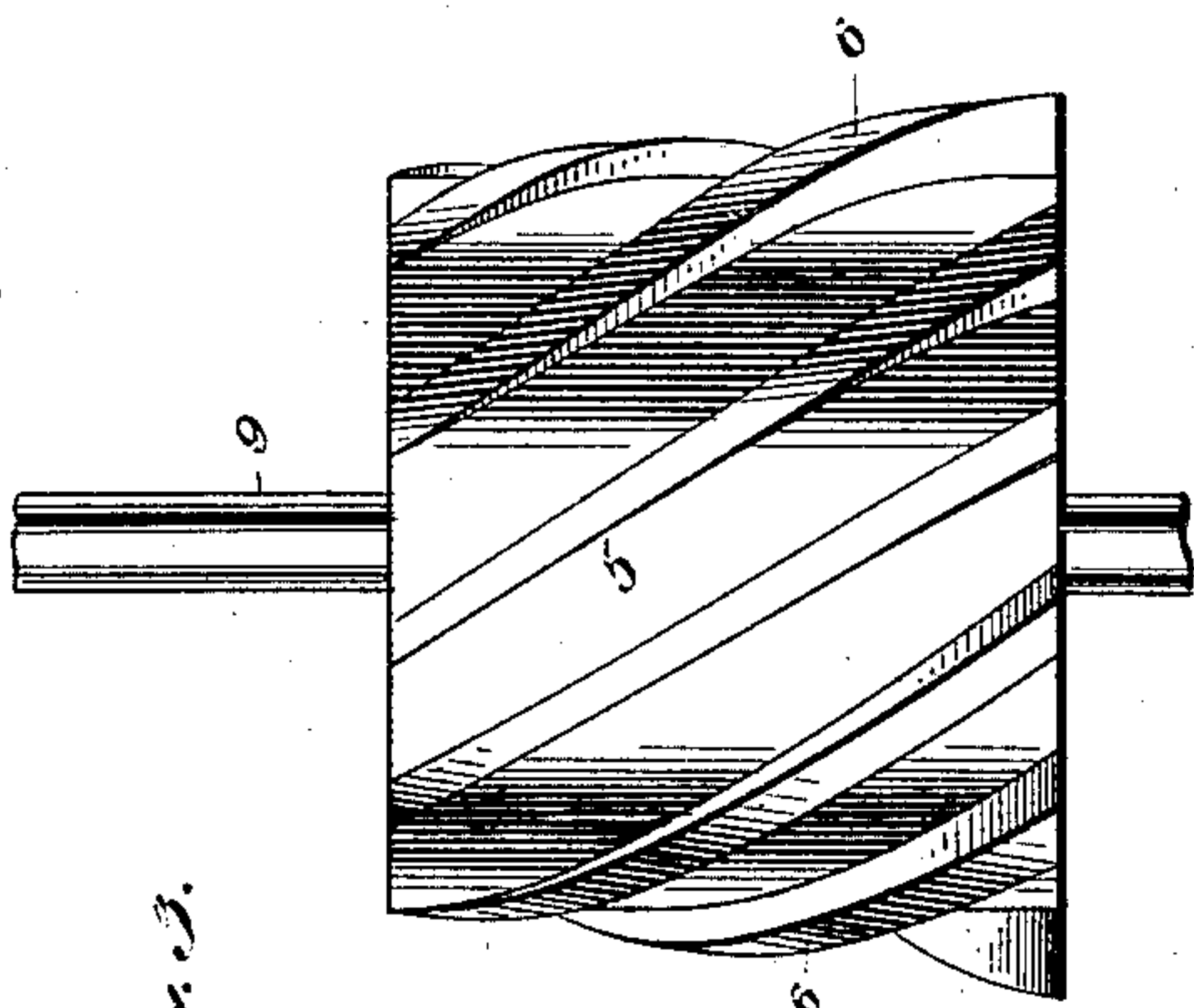
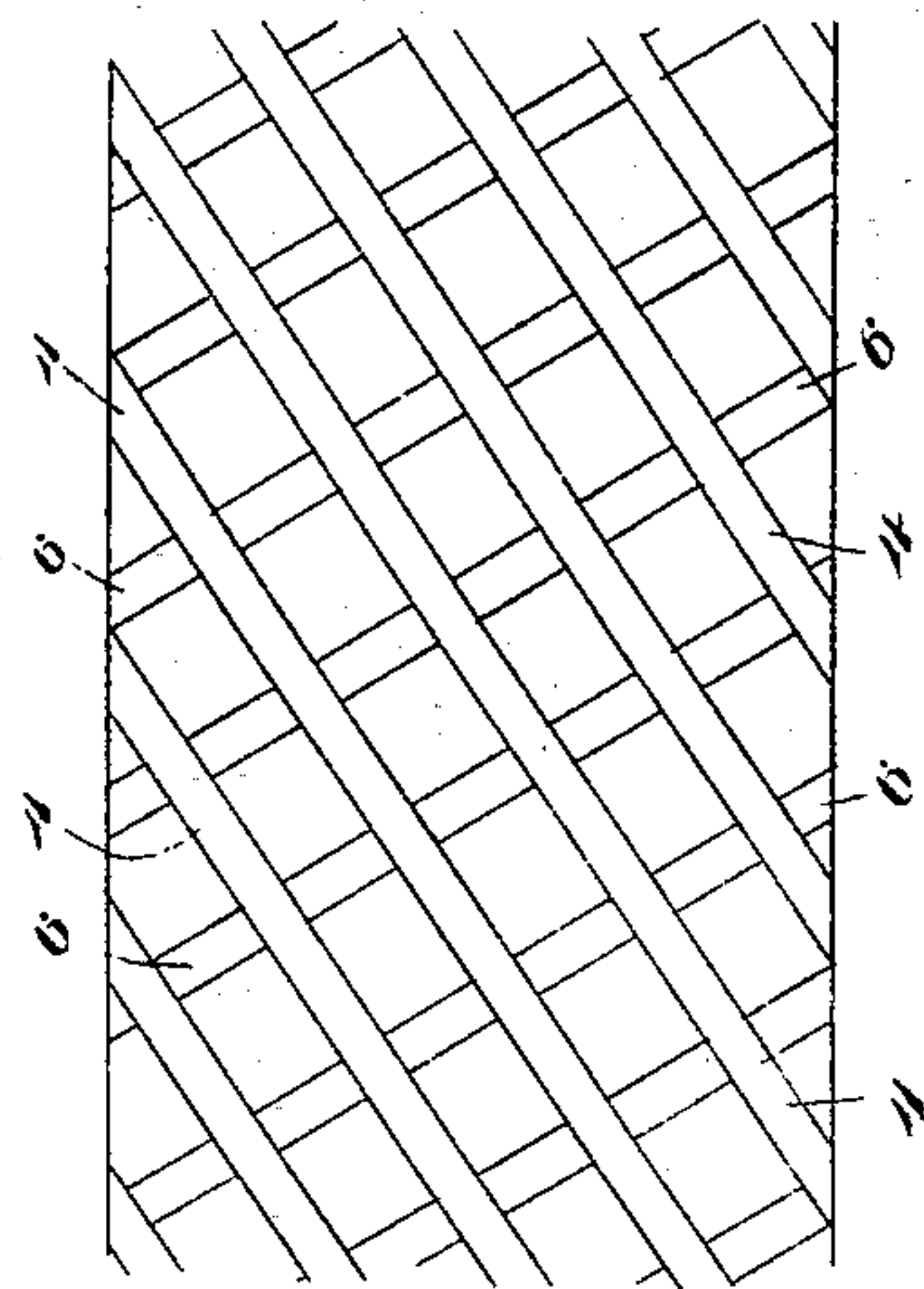


Fig. 3.

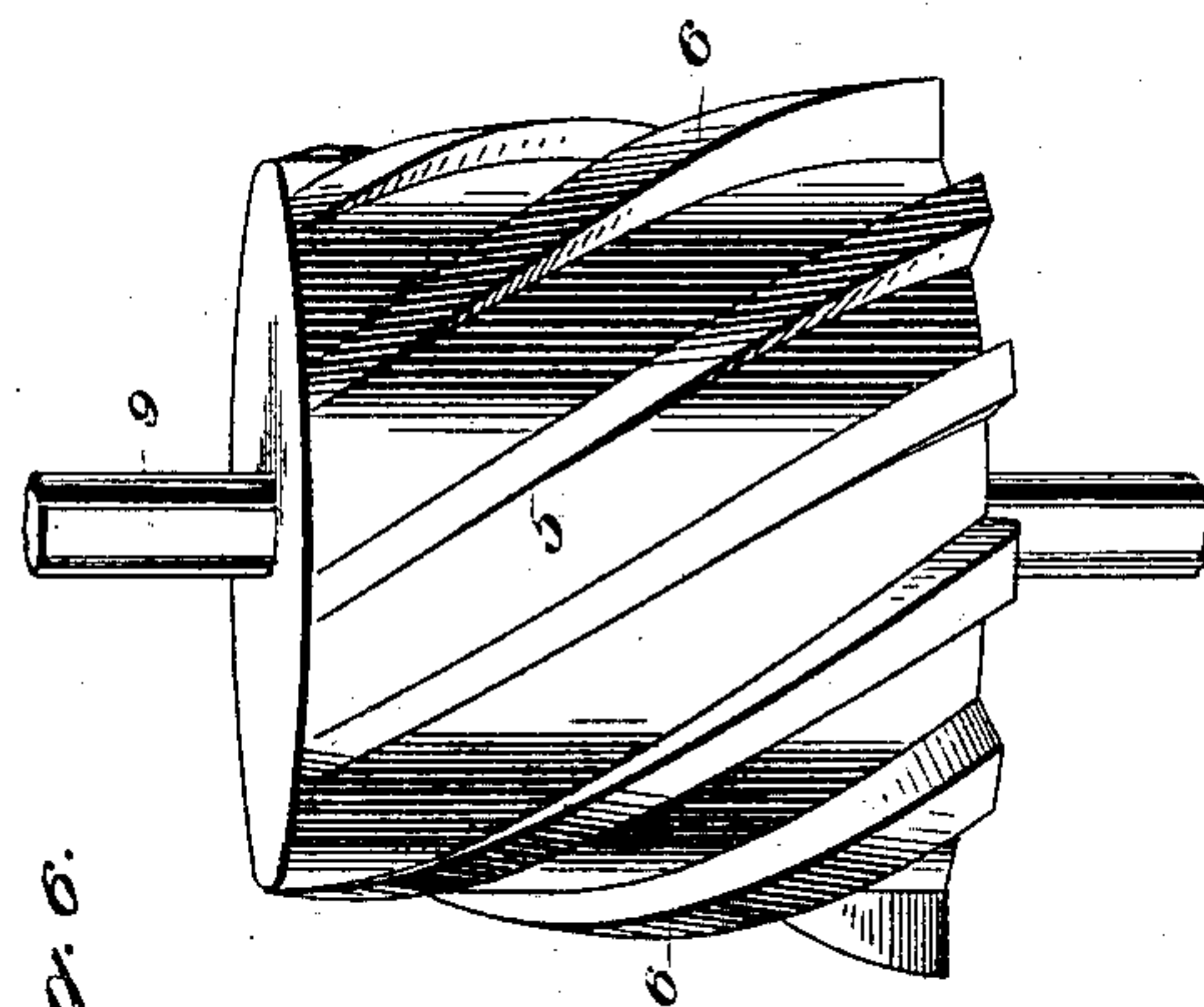


Fig. 6.

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UNITED STATES PATENT OFFICE.

CHARLES BRIMER, OF BIG INDIAN, NEW YORK.

TURBINE WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 630,482, dated August 8, 1899.

Application filed June 11, 1898. Serial No. 683,218. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BRIMER, a citizen of the United States, residing at Big Indian, in the county of Ulster and State of New York, have invented a new and useful Turbine Water-Wheel, of which the following is a specification.

This invention has relation to that class of motors known as "turbine water-engines," and is designed to prevent the spent water from detracting from the speed or power of the water-wheel, this result being accomplished by providing a free escape for the water after it has expended its force upon the buckets of the water-wheel when the engine is in operation.

A further purpose of the improvement is to convert a maximum amount of the force of the head of water into available energy for driving machinery or parts to be operated. Simplicity of construction and effectiveness of operation are features sought to be attained in constructing the motor, the parts being readily accessible for any desired purpose.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a turbine water-wheel constructed in accordance with this invention. Fig. 2 is an elevation thereof, a portion of the penstock and curb being broken away. Fig. 3 is a detail view in elevation of the motor-wheel. Fig. 4 is a view of the inner side of the curb, showing the relation of the buckets. Fig. 5 is a diagrammatic view showing the disposition of the reversely-disposed buckets of the curb and wheel. Fig. 6 is a detail view in perspective of the motor-wheel.

Corresponding and like parts are referred to in the following description and indicated in the views of the drawings by the same reference characters.

The curb 1 is formed with exterior flanges

2 and 3 at its ends for a purpose presently to be described. A series of buckets 4 are provided upon the inner side of the curb and are disposed in parallel relation and extend from the upper to the lower end of the curb in spiral form. These buckets are constructed in the shape of flanges or ribs and gradually decrease in depth from their upper to their lower ends, the latter merging into the inner side or wall of the curb.

The motor-wheel 5 fits snugly within the curb 1 and is formed with a series of buckets 6 upon its outer side, arranged in parallelism and inclining in inverse order to the buckets 4. The buckets 6 are constructed in a manner similar to the buckets 4 and increase in depth from their upper to their lower ends. The buckets 6 incline less from the perpendicular than the buckets 4. Hence the water impacts against them with greater force, thereby impelling the wheel with greater velocity. By having the buckets 4 and 6 inclined in reverse directions the water impacts against the buckets 6 approximately at right angles, thereby expending its greatest force in driving the wheel forward. The tapered construction of the buckets 6 permits the water to strike said buckets near their upper ends without detracting from the speed or power of the wheel in the slightest degree, and the widening of said buckets allows for ample clearance for the escape of the water after it has expended its propelling force.

The motor-wheel can be moved vertically within the curb, so as to compensate for wear between the buckets 4 and 6, thereby insuring close contact between them and preventing escape of any of the water without imparting its force to propel the wheel.

A bridge-tree 7 is provided centrally with an adjustable bearing 8, upon which is stepped the vertical shaft 9 of the motor-wheel 5, said bearing 8 consisting of a set-screw having its upper end made conical and entering a corresponding recess in the lower end of the shaft 9. The end portions of the bridge-tree embrace the sides of the curb and have inner notches 10, which receive the lower flange 3, whereby positive connection is had between the bridge-tree and curb without entailing the necessity of other securing means.

The penstock 11 is of spiral form and the

passage therein communicates at its lower edge with the upper portion of the curb, so as to deliver the water into the spaces formed between the buckets 4 in a whirling condition, whereby no material part of the force due to the head or pressure is lost. An outer flange 12 is provided at the lower end of the penstock and matches with the upper flange 2 of the curb and makes close connection therewith, so as to prevent any escape of water. This penstock connects with a flume or water-race in any of the usual ways.

A bracket 13 is applied to the penstock and its vertical member or bar has an inner notch 14 at its lower end to receive the contiguous or subjacent flanges 2 and 12, thereby securing the respective parts together at one side. A strip or bar 15 is secured to the penstock opposite the bracket 13, and its lower end is notched at 14 to receive the flanges 12 and 2 and connect them at the other side of the engine. Wedges 16 are driven into the notches 14 and serve to draw the flanges 2 and 12 together. The shaft 9 is mounted with its upper end in a bearing 17, applied about centrally to the horizontal portion of the bracket 13. Power is taken from the shaft 9 of the motor-wheel by means of a grooved pulley 18 applied thereto. Obviously power may be taken from the shaft in any of the ways commonly resorted to in the mechanic arts for transmitting power from a motor to the machine or part to be driven. The buckets may be formed integrally with their respective parts or may be made separate therefrom and applied thereto; but the former construction is preferable because of the simplicity of manufacture and resultant durability and economy of construction.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a turbine water-wheel, the combination of a curb and a motor-wheel provided upon their contiguous or opposing sides with similarly-formed buckets having a spiral arrangement and disposed in inverse order, said buckets extending from the upper to the lower ends of the curb and wheel and increasing in depth throughout their length in reverse directions, substantially as set forth.

2. In a turbine water-wheel, the combination of a curb and a motor-wheel provided upon their opposing sides with spirally-arranged buckets disposed in parallel relation and in inverse order, the buckets of the curb inclining more from the perpendicular than the buckets of the wheel and decreasing in depth from their upper to their lower ends, and the buckets of the wheel increasing in depth from their upper to their lower ends, substantially as and for the purpose set forth.

3. In a turbine water-wheel, a curb and motor-wheel each of said parts having ribs of different thicknesses at different points in

their length and each constituting buckets, in combination with a penstock having a waterway communicating with the passages between the curb and wheel and gradually contracted at its discharge end, substantially as described.

4. In a turbine water-wheel, the combination of a curb having inner buckets spirally arranged and decreasing in depth from their upper to their lower ends, a motor-wheel having exterior buckets spirally arranged in inverse order to the buckets of the curb and increasing in depth from their upper to their lower ends, an adjustable bearing for the wheel-shaft, and a penstock having a spiral passage communicating at its lower edge with the spaces formed between the buckets of the curb, substantially as set forth.

5. In a turbine water-wheel, the combination with the curb having upper and lower outer flanges, a penstock placed upon the curb and having a lower outer flange, and a motor-wheel, of bars secured to the sides of the penstock and having inner notches at their lower ends to receive the contiguous flanges of the curb and penstock, one of the bars having its upper portion extending over the penstock and forming a support for the upper end of the motor-wheel shaft, and a bridge-tree having its end portions embracing the sides of the curb and notched to receive the lower flange and centrally provided with a bearing for the lower end of the motor-wheel shaft, substantially as described.

6. In a turbine water-wheel, the combination of a curb and a motor-wheel within the same, said parts being provided upon their contiguous faces with buckets, and said buckets being of different thicknesses at different points in their length and the thin portions of the buckets on one part cooperating with the thick portions on the other part, and vice versa, and being disposed in reverse directions, substantially as described.

7. In a turbine water-wheel, the combination of a curb, a motor-wheel within the same, said parts being provided upon their contiguous faces with buckets, and said buckets being of different thicknesses at different points in their length and the thin portions of the buckets on one part cooperating with the thick portions on the other part, and vice versa, and being disposed in reverse directions, a shaft for supporting said motor-wheel, and an adjustable bearing for supporting said shaft, thereby permitting adjustment of the latter from the direction of its length, substantially as described.

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

CHARLES BRIMER.

Witnesses:

U. S. GRANT CURE,
ORVILLE V. SMITH.