

(No Model.)

J. HURLEY.
WATER MOTOR.

No. 581,422.

Patented Apr. 27, 1897.

Fig. 1.

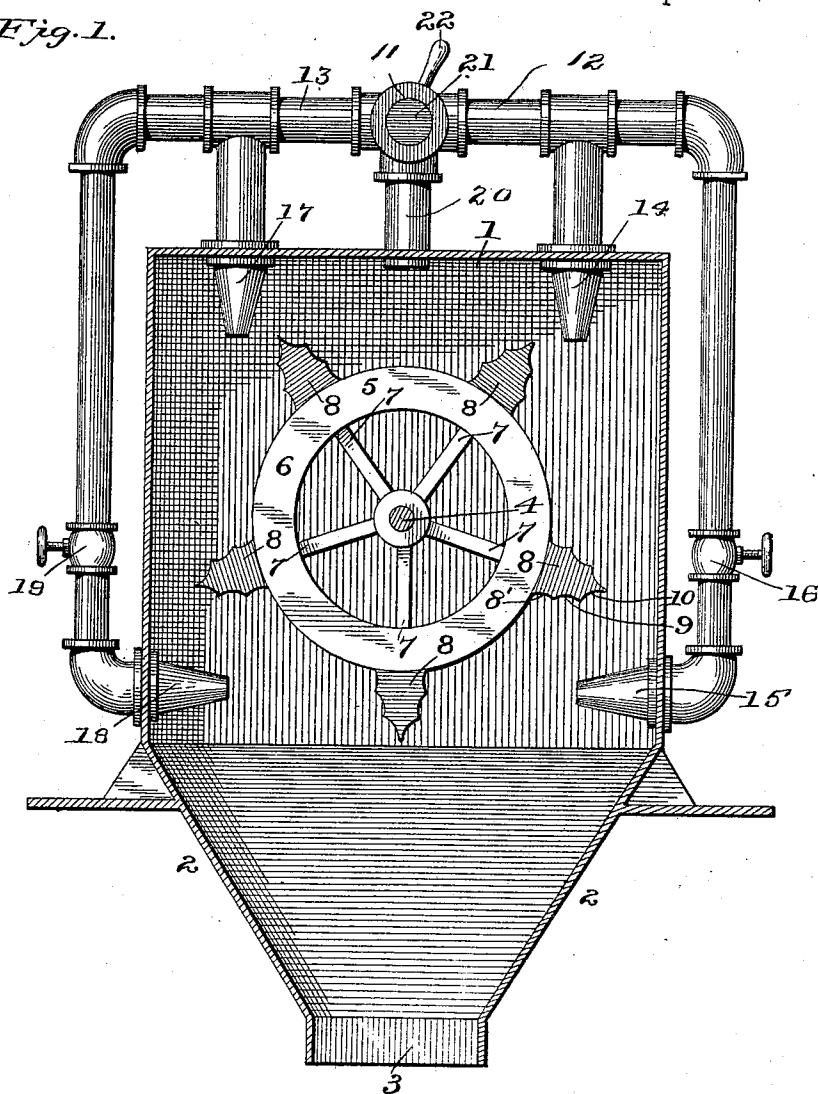
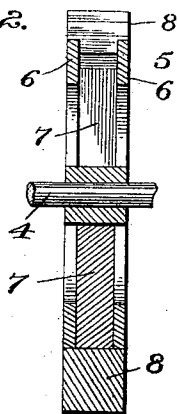


Fig. 2.



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JAMES HURLEY, OF CHICAGO, ILLINOIS.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 581,422, dated April 27, 1897.

Application filed June 1, 1896. Serial No. 593,880. (No model.)

To all whom it may concern:

Be it known that I, JAMES HURLEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in water-motors, the object of the same being to provide a simple and cheap device whereby the power of water may be utilized for driving machinery or for any other purpose that may be desired.

The invention consists of a casing, preferably rectangular in cross-section, with tapering lower ends which are open for the discharge of waste water therefrom, a water-wheel mounted to rotate on the inside of said casing, a main supply-pipe for water, branch pipes connected thereto and leading outwardly therefrom, a pair of nozzles in each of said branch pipes entering the casing on opposite sides thereof, the members of each pair of nozzles being disposed at right angles to the other, and means for regulating the direction of flow of the water in said branch pipes.

The invention also consists in other details of construction and combination of parts, which will be hereinafter more fully described and claimed.

In the drawings forming a part of this specification, Figure 1 represents a vertical sectional view through my improved motor. Fig. 2 is a cross-section of the water-wheel.

Like reference-numerals indicate like parts in the different views.

The casing 1 is preferably rectangular in cross-section and has tapering lower ends 2, with the discharge-opening 3 for the water therethrough. Mounted in suitable bearings in the sides of the casing 1 is a shaft 4, to which is secured a water-wheel 5, made up of two parallel annular disks 6 6, with interposed blades 7, extending from the hub to the rim, and with blades 8 8, projecting outwardly from said rim. Five of each kind of blades have been illustrated in the drawings, and I prefer to use this number, but do not wish to limit

myself to any particular number. The blades 8 are of substantially the form shown in the drawings, the sides thereof being made up of three concave portions 8' 9 10, which, during the rotation of the wheel 5, present a face to the actuating stream of water at substantially right angles thereto.

11 represents a main supply-pipe for water, having branches or extensions 12 13 on each side thereof, the branch 12 being provided with a nozzle 14, which enters the casing 1 through the upper face or top thereof on the right-hand side, and also a nozzle 15, which enters the casing 1 at a point near its lower end for projecting a stream at right angles to that of the nozzle 14. A valve or cut-off 16 is provided in the branch or extension 12 between the nozzles 14 and 15 for shutting off the stream from the lower nozzle 15. The extension or branch pipe 13 is provided with similar nozzles 17 18, the nozzle 17 entering the casing 1 on the left-hand side and extending vertically thereinto, and the nozzle 18 entering the casing 1 near the lower end thereof in a horizontal direction. A similar valve or cut-off 19 is also provided in the extension or branch pipe 13 between the nozzles 17 and 18.

Leading from the main supply pipe or conduit 11 is a branch pipe or extension 20, which enters the center of the top of the casing 1 at a point just above the vertical axis of the wheel 5. The three-way valve 21, provided with an operating-handle 22, is located at the juncture of the main supply pipe or conduit 11 and the branch pipes or extensions 12 13 20, so that upon turning said valve to one position or another the water will be admitted to the branch pipe 12, to the branch pipe 13, or to the branch pipe 20.

The operation of my device is as follows: If it is desired to operate the water-wheel 5 to the right, the three-way valve 21 is turned so as to admit the water from the conduit 11 into the branch pipe 12. From this branch pipe said water is admitted to the interior of the casing 1 through the nozzles 14 and 15, the stream therefrom engaging two of the blades 8 8, and by reason of the concaved sectional faces 8' 9 10 of said blades the impact of the water is received by both of said blades operated upon on one of its faces at right angles to the direction of the stream. The power of

the water is thus utilized to its greatest extent. If it is found that less power is required to operate the wheel 5, the stream from the nozzle 15 may be cut off by closing the valve 5 16 in the branch-pipe 12. When this is done, all the water will be admitted to the interior of the casing 1 through the nozzle 14. If it is desired to stop the motor entirely, the three-way valve 21 is so turned as to admit the 10 stream through the pipe or extension 20, when the stream will be admitted to the interior of the casing 1 at a point directly above the axis of the water-wheel 5 and the force thereof will be nullified. When it is desired to reverse the motor, it is simply necessary to turn 15 the three-way valve 21 so that the stream will be admitted to the interior of the casing 1 through the nozzles 17 18 in the branch pipe 13 on the left side of the casing. All of the 20 water after it has been used may be discharged through the opening 3 in the lower end of the casing 1.

By my construction it will be seen that the power of the water is utilized to its greatest 25 extent by reason of the peculiar construction of the blade 7 of the water-wheel 5 and that the said wheel acts as a fly-wheel, leaving the outer end of the shaft 4 to be connected with any suitable machinery or device to be driven 30 as may be desired.

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

1. In a water-motor, the combination of a 35 casing having an opening in the lower end thereof, a water-wheel mounted to rotate on the inside of said casing, a main supply-pipe for water, branch pipes connected thereto and leading outwardly therefrom, a pair of noz- 40 zles in each of said branch pipes entering the casing on opposite sides thereof, the members

of each pair of nozzles being disposed at right angles one to the other, and means for regulating the direction of flow of the water in said branch pipes, substantially as and for 45 the purpose described.

2. In a water-motor, the combination of a casing having an opening in the lower end thereof, a water-wheel mounted to rotate on the inside of said casing, a main supply-pipe 50 for water, branch pipes leading outwardly therefrom, a pair of nozzles in each of said branch pipes entering said casing on opposite sides, the members of each pair of said nozzles being disposed at right angles one to the 55 other, a valve or cut-off in each of said branch pipes located between said nozzles, and means for regulating the direction of flow of the water through said branch pipes, substantially as and for the purpose described. 60

3. In a water-motor, the combination of a casing having an opening in the lower end thereof, a water-wheel mounted to rotate on the inside of said casing, a main supply-pipe 65 for water, branch pipes leading outwardly therefrom in opposite directions, an extension entering the upper end of said casing at a point directly above the axis of said water-wheel, a nozzle in each of said branch pipes 70 entering the casing on opposite sides thereof and a three-way valve at the juncture of said main supply-pipe, said extension, and said branch pipes, substantially as and for the purpose described.

In testimony whereof I have signed this 75 specification in the presence of two subscribing witnesses.

JAMES HURLEY.

Witnesses:

ALFRED TRODESON,
OTTO HELMS.