

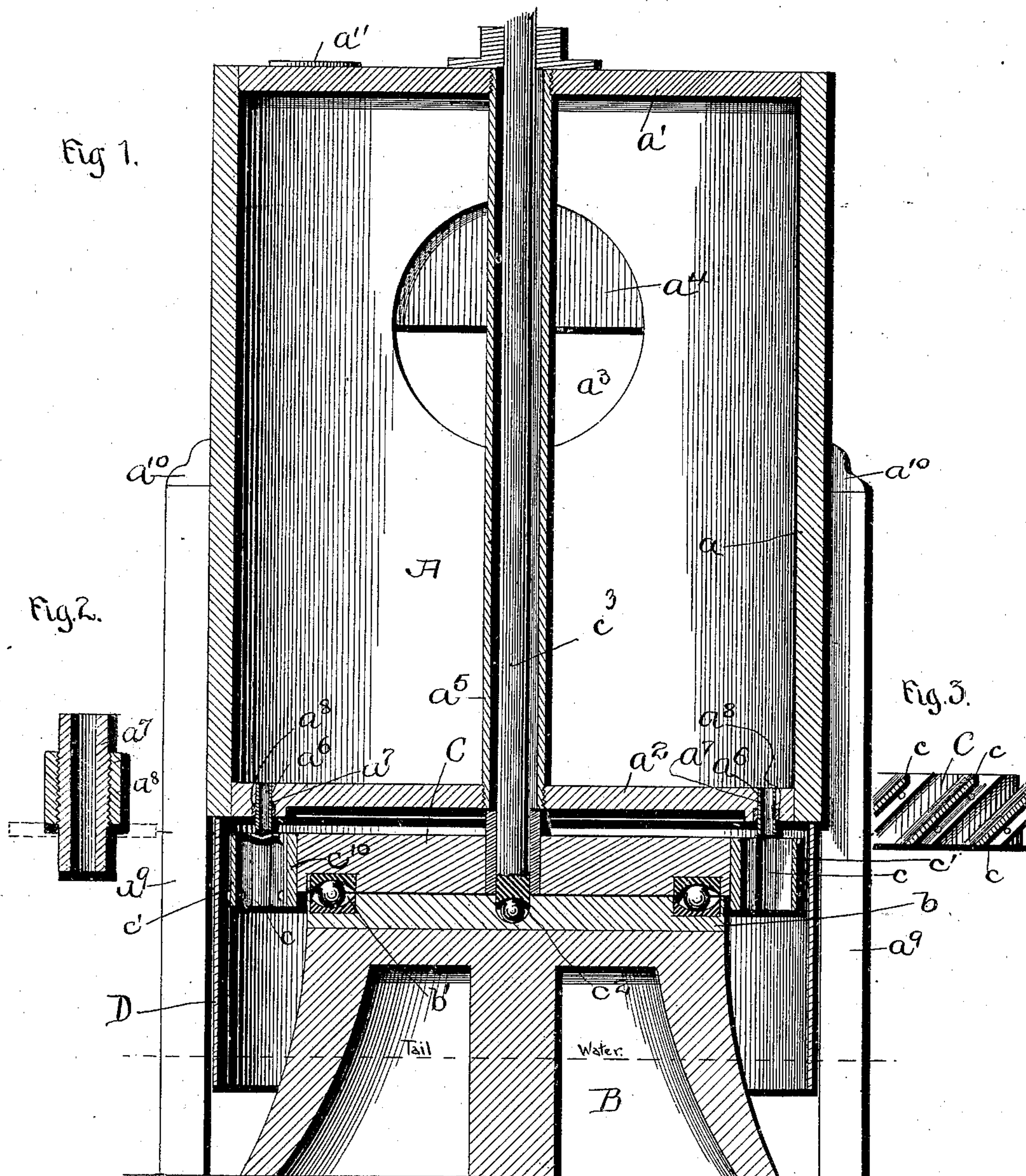
No. 663,812.

Patented Dec. 11, 1900.

H. JONES.
WATER WHEEL.

(Application filed May 31, 1898.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY JONES, OF COLWOOD, CANADA, ASSIGNOR OF ONE-FOURTH TO
WILLIAM GEORGE H. ELLISON AND WILLIAM J. WALE, OF SAME
PLACE.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 663,812, dated December 11, 1900.

Application filed May 31, 1898. Serial No. 682,112. (No model.)

To all whom it may concern:

Be it known that I, HENRY JONES, a citizen of the Dominion of Canada, residing at Colwood, in the county of Victoria, Province of British Columbia, Canada, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare the following to be a clear, full, 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 improvements in water-wheels.

The object of my invention is to provide a device of this character in which the water will be passed to the vanes in such manner as will exert a maximum amount of power.

A further object is to provide a water-wheel which will be durable in construction, which is operated with absolute precision, and which can be manufactured at a moderate cost.

To these ends my invention consists in the improved construction and combination of parts hereinafter fully described, and particularly pointed out in the claims.

In the drawings, in which similar letters of reference indicate similar parts in all of the views, Figure 1 is a vertical sectional view of my improved water-wheel shown in position for use. Fig. 2 is a sectional view of one of the nozzles. Fig. 3 is a sectional view showing the arrangement of the vanes.

A designates a cylindrical penstock having the sides a , top a' , and bottom a^2 . A suitable opening a^3 communicates with the head-race, the entrance of the water being regulated by means of a suitable gate a^4 . A central tube a^5 is secured in the top and bottom, within which the shaft of the wheel proper is located. The bottom a^2 is provided with openings a^6 , arranged near its outer edge, within which are placed nozzles a^7 , having their peripheries screw-threaded and adapted to be screwed into collars a^8 , mounted in said openings a^6 . When less pressure is desired, the number of the openings is reduced by removing one or more nozzles a^7 and inserting plugs into the collars. If desired, a stop may be formed on the nozzle, as shown in dotted lines in Fig. 2, said stop limiting the inserting

movement of the nozzle, so that its upper end will not project into the penstock. The penstock is secured on suitable supports a^9 by means of supporting-flanges a^{10} . The penstock is also provided with suitable manholes a^{11} and suitable air-cocks and pressure-gages, the latter not being shown, they not forming any particular part of my invention and may be of any preferred construction.

B designates a base formed of suitable material and having a reinforcing top b , within which is mounted, if desired, a ball-bearing raceway b' , or, if preferred, roller-bearings may be substituted.

C designates my improved wheel, having its central portion formed of suitable material and having on its outer face vanes c , formed, preferably, as shown in the drawings, although I do not limit myself to this precise construction. These vanes are adapted to be secured to the outer face of a peripheral band c^{10} , secured to the periphery of the wheel C and extending to a point below the lower plane of said wheel C and to a supplemental ring or rim c' , and are arranged at an angle to the axis of the wheel, the position being such that water falling through the nozzles descends on the central portion of the vanes. This construction prevents any possibility of the water passing into the raceway b' and in addition is such that said raceway or annular support is located intermediate the upper and lower planes of the vanes, insuring a smooth-running wheel C, the pressure of the water on the vanes below the plane of the raceway or support holding said wheel steady. As shown, the vanes are preferably formed with a beveled upper edge to prevent the water from splashing, &c. The shaft c^3 is preferably mounted on a ball-pivot c^2 and extends upward through tube a^5 .

D designates a draft-tube adapted to extend below the level of the tail-water and be secured to the penstock outside of said wheel.

The operation is obvious, inasmuch as when the water is passed downward through the nozzles it drops onto the vanes, causing them to be carried backward, and thus rotate the wheel. The power is regulated by the num-

ber of nozzles remaining open. By this construction the entire amount of water used exerts its full power to rotate the wheel, there being no tendency to cause back pressure of any kind.

Suitable oil-ducts are provided for the oiling of the various bearings.

By the construction shown it will be readily seen that the vane-carrying disk is supported not only at its center, but at a point near its outer periphery. This construction compels the wheel or disk to run in a true horizontal plane, in addition to which any tendency to sag under the pressure of the water falling on the vanes is absolutely prevented.

Having thus described my invention, what I claim as new is—

1. The combination with a penstock having an inlet-gate, a top and a bottom, said bottom having an annular series of vertically-extending ports arranged therein, each port being controllable independently; of a supporting-base located below said bottom; a shaft pivotally supported thereon, said shaft extending vertically through said penstock; a casing for said shaft; a wheel secured to said shaft near the lower end thereof; a series of inclined vanes located on the outer periphery of said wheel, said vanes extending below the lower plane of said wheel, and being adapted to receive the water passing from said vertically-extending ports and rotate said shaft; and an annular antifrictional support for said wheel, located contiguous to said vanes and intermediate the upper and lower planes thereof, substantially as described.

2. The combination with a penstock having an inlet-gate, and an annular series of outlet-ports each controllable independently; of a supporting-base located below said penstock; a shaft extending vertically through said penstock and pivotally supported on

said base; a wheel secured to said shaft near the lower end thereof; a peripheral band secured to said wheel, said band being of a width greater than the width of the wheel and extending below the lower plane thereof; a series of inclined vanes located on the outer periphery of said band; a supplemental rim or band secured to the outer edges of said vanes, whereby pockets will be formed; and an annular antifrictional support for said wheel, located contiguous to said peripheral band and intermediate the upper and lower planes thereof, substantially as described.

3. A water-wheel comprising a support; a vertically-extending shaft pivotally mounted at the center of the top of said support; a wheel secured to said shaft contiguous to the upper face of said support, said wheel having a series of peripheral vanes extending below the lower plane thereof; an annular raceway formed between said wheel and said support, said raceway having balls to form an antifrictional device, said raceway being formed contiguous to the periphery of said wheel, said raceway being located on a plane intermediate the top and bottom planes of said vanes, whereby said wheel will have both a central and an annular support, substantially as described.

4. In a turbine water-wheel, the combination of the rotating wheel having peripheral vanes; of a central support therefor; and an additional support located annularly near said vanes and intermediate the top and bottom planes thereof, whereby any tendency of sagging under water-pressure is prevented.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

HENRY JONES.

Witnesses:

WILLIAM GEORGE HOLLEYWELL ELLISON,
WILLIAM JOHN WALE.