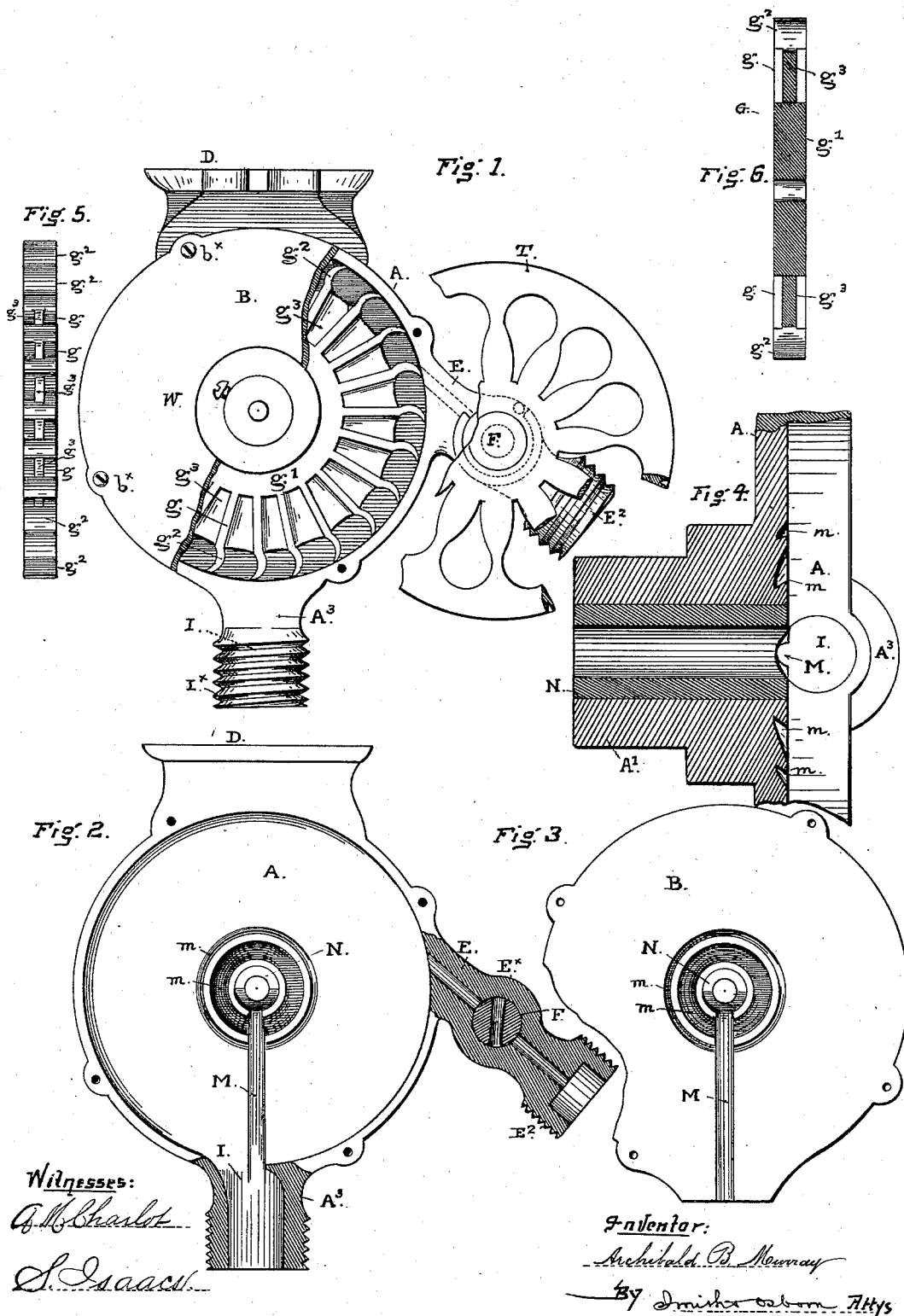


(No Model.)

A. B. MURRAY.
WATER MOTOR.

No. 474,851.

Patented May 17, 1892.



UNITED STATES PATENT OFFICE.

ARCHIBALD B. MURRAY, OF SAN RAFAEL, CALIFORNIA.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 474,851, dated May 17, 1892.

Application filed August 12, 1891. Serial No. 402,476. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD B. MURRAY, a citizen of the United States, residing in San Rafael, county of Marin, and State of California, have invented certain new and useful Improvements in Water-Motors, of which the following is a specification.

My invention relates to improvements in water-motors of that class or kind in which the force of a jet or stream of water impinging against the rim of a bucket-wheel in a close chamber or casing propels the wheel and gives rotary motion to a pulley or a gear on the same shaft; and it comprises a novel construction of wheel and its combination with a casing having an inlet-aperture tangent to the rim of the wheel and a discharge-outlet at the bottom or lowest part of the casing; also, an improved shaft-bearing to prevent leakage.

The following description explains the nature of the improvements and the manner in which I proceed to produce a water-motor in accordance with my invention, the accompanying drawings being referred to by letters.

Figure 1 is a side elevation of my improved motor with the side of the casing broken away to expose the wheel-chamber and wheel. Fig. 2 is a front view of that part of the wheel-casing in which the wheel is set with the wheel removed and the casing shown in section at the inlet and discharge passages. Fig. 3 is a front view of the removable side of the casing. Fig. 4 is a horizontal cross-section on an enlarged scale through the shaft-bearing and adjacent part of the wheel-chamber. Fig. 5 is an edge view of the wheel, and Fig. 6 is a cross-section through the center of the wheel.

The wheel-chamber is formed in the part A and is covered by a plate B, held by screws b^x . The faces of these two parts are finished to make a water-tight joint. Long hubs A' for the wheel-shaft are cast on the two parts A B. A bracket D, cast in one piece with the part A, is provided with ears having screw-holes to fix the motor to the under side of a sewing-machine table or other support.

The water-inlet is at one side of the casing and is formed in the neck E. This part is cast on the part A of the casing with a chamber E^x for a plug-valve F and a screw-threaded coupling E^2 on the end for the supply-pipe.

The neck is bored longitudinally for a water-passage, and the valve F is ground to fit the seat in the body E^x .

The wheel G is formed with arms $g g$, radiating from a hub or center plate g' and terminating in curved buckets or blades g^2 , that present their concave sides toward the jet-apertures when the wheel is set in the casing. The arms are connected one with another by a web g^3 , extending from the center plate outward to the buckets and of less thickness than the arms, while the space between one bucket and another above the web is the full width of the wheel-chamber. From the bottom of the bucket to the hub of the wheel the space between the buckets and the center plate is divided by the web. This construction brings the full force of the jet against the buckets and the arms and to a considerable degree overcomes the reaction of the jet, thereby securing the most effective application of the head or pressure of water against the wheel.

The waste-outlet I is the full width of the water-chamber and is carried through the neck or extension A^3 at the bottom of the casing A. It has a screw-threaded coupling I^x on the outside for a waste-pipe. The wheel is fast on the shaft and the ends of the shaft extend through the casing to take a pulley or gear on one end and a balance-wheel on the other. In the present construction a small pulley W is fixed on the end of the shaft outside the casing. The valve is turned by a wheel T, fast on the head of the plug, and having a groove in its rim to receive a cord or wire, the ends of which are carried down and made fast to the treadle of the sewing-machine table, one end of the wire being made fast to the toe and the other end to the heel of the treadle, so that the wheel T is turned and the valve operated from the treadle at the bottom of the table. A hand wheel or lever can be substituted for this means when desired.

In the inner face of the case A and in the corresponding face of the cover B are water-grooves $m m$, concentric with the aperture for the shaft, and intersecting these grooves is a water-channel M, extending perpendicularly from the shaft-bearing downward to the outlet at the bottom. The hub of each part of the casing has a bushing of Babbitt metal N, the inner end of which for one-half the face

is cut away on a bevel, as indicated by the shade-lines in Figs. 2 and 3 and as shown in the sectional view, Fig. 4. The grooves and channels formed in this manner around the shaft prevent the water from following the shaft and escaping between it and the bearing, so that I am enabled to dispense with packing of any kind and still obtain bearings that are completely water-tight.

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

1. The combination, with the shaft-bearing, of the casing having concentric water-grooves and a perpendicular water-channel terminating in the waste-outlet, substantially as set forth.

2. The herein-described water-motor, con-

sisting of the two-part wheel-chamber having the inclined neck with inlet-passage, valve-chamber, and the plug-valve, a waste-outlet at the bottom, the wheel having radial arms terminating in curved buckets and united by a web between the arms, and the shaft-bearings having chamfered inner faces, said wheel-chamber having the water-grooves around the shaft and the perpendicular water-channel running into the waste-outlet, substantially as set forth.

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

ARCHIBALD B. MURRAY. [L.S.]

Witnesses:

EDWARD E. OSBORN,

CHAS. E. KELLY.