No. 771,636. PATENTED OCT. 4, 1904.

H. A. HISCOX.

WATER MOTOR.

APPLICATION FILED MAR. 4, 1904.

NO MODEL.

Fig. 1.

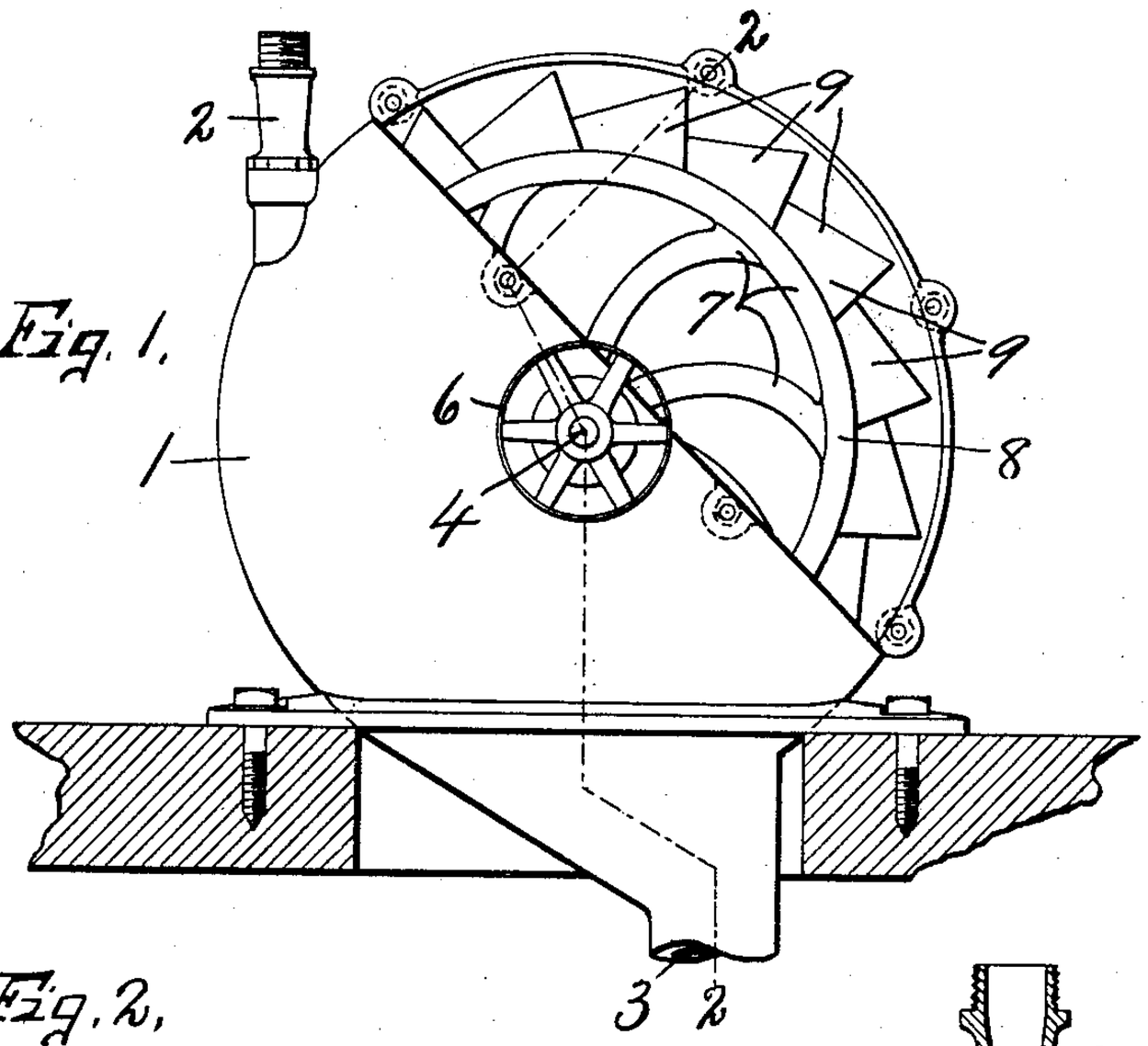


Fig. 2.

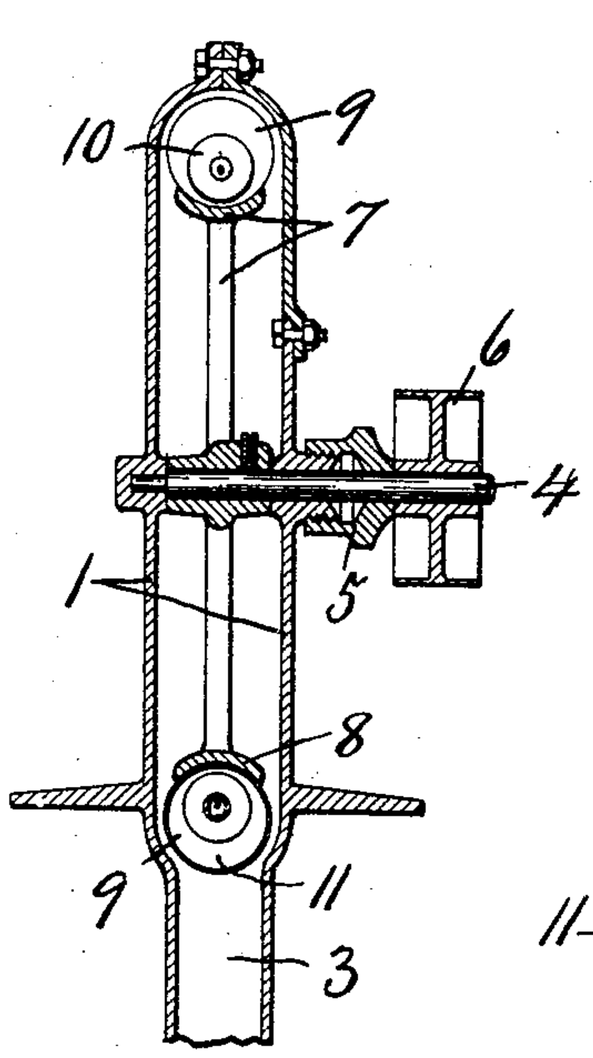


Fig. 3.

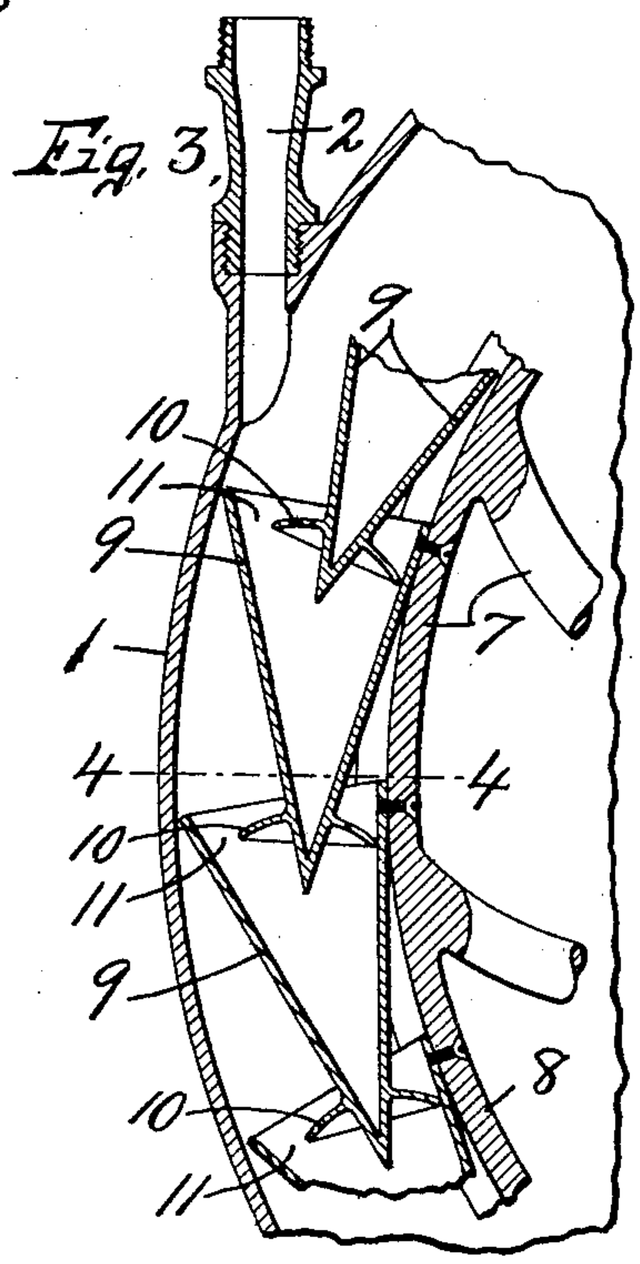


Fig. 4.

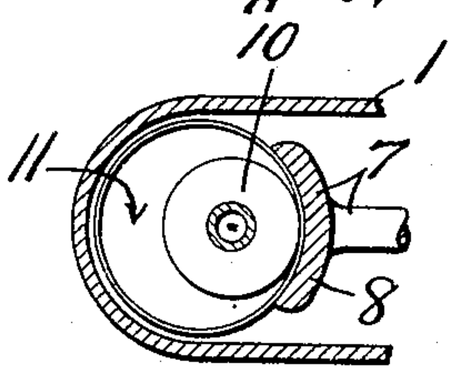


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PHOTO-LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 771,636. Patented October 4, 1904.

# UNITED STATES PATENT OFFICE.

HENRY A. HISCOX, OF CLIFTON SPRINGS, NEW YORK.

## WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 771,636, dated October 4, 1904.

Application filed March 4, 1904. Serial No. 196,546. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. HISCOX, of Clifton Springs, in the county of Ontario, in the State of New York, have invented new and useful Improvements in Water-Motors, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in water-motors in which a jet of water under pressure is directed tangentially against suitable impact-faces upon the periphery of the rotary element to rotate said element.

The object of my present invention is to impart a maximum degree of power to the rotary element of the motor from a minimum-sized jet or water-pressure. This object, briefly stated, is accomplished by providing a rotary element with a series of conical buckets arranged circumferentially one in advance of the other around the periphery of the rotary element with their apexes extending in the direction of rotation and into the bases of the adjacent buckets, each apex having an annular flange or deflecting-plate wholly within the base of the next adjacent section and also inclining in the direction of rotation, so as to afford additional surfaces upon the outer sides of the buckets and upon which the water may impinge as well as upon the inner sides of the buckets.

Other objects and uses will appear in the following description.

In the drawings, Figure 1 is an end elevation of my improved motor, showing a part of the case removed to disclose the interior rotary element. Fig. 2 is a sectional view taken on line 2 2, Fig. 1. Fig. 3 is an enlarged sectional view through a portion of the rotary element and its buckets and also through a portion of the case having the inlet-opening. Fig. 4 is a sectional view taken on line 4 4, Fig. 3.

Similar reference characters indicate corresponding parts in all the views.

In carrying out the objects stated I provide a suitable case 1, which in this instance consists of a hollow circular shell of cast-iron or other suitable material having an inlet nozzle or opening 2 and a discharge or exhaust opening 3, the inlet-opening being disposed substantially tangential to the periphery of the case above its horizontal center, while the exhaust-opening is located, as usual, at the bottom, where the water may discharge freely and with as little resistance and impedance to the rotary element as possible.

A rotary shaft 4, Fig. 2, is journaled in the end walls of the case 1 and extends outwardly through a suitable stuffing-box 5 to receive a driving member, as a pulley 6, or other power-transmitting mechanism. Mounted upon the inner end of the shaft within the case is a rotary element consisting of a wheel 7, having an annular rim 8. The periphery of this rim is preferably concave in cross-section and receives and supports a series of conical buckets 9. These buckets are arranged one in advance of the other circumferentially around the rim 8 with their apexes pointing in the direction of rotation, the apex of each bucket extending into the open-ended base of the next adjacent bucket, as best seen in Fig. 3. Each of these conical buckets is preferably circular in cross-section and the inner wall of each is secured to the periphery of the wheel 7 and is disposed substantially tangential to said periphery from its point of securement, so that any water which may strike the inner wall of the bucket is deflected outwardly from the periphery instead of inwardly toward the center. The apex of each bucket is provided with an annular dish-shape flange 10, which lies wholly within the open-ended base of the next preceding cone and preferably rests upon the inner wall of the cone nearest to the periphery of the wheel. These flanges 10 are of smaller area than the cross-sectional area of the part of the cone which incloses the same, and therefore an open space 11 is left between the periphery of the flange and the outer wall of the cone which incloses the flange to permit the passage of the water into the apex of the bucket. These flanges 10 receive the direct impact or force of the water as it is discharged through the nozzle or jet 2, which gives additional impetus to the wheel, and thereby utilizes to the utmost the power of the water which is discharged through the jet. It will be observed upon reference to

Fig. 3 that as the cones are successively brought into line with the power-jet the water first enters into the apex of the cone through the passage 11, and any portion of the water which may be deflected backwardly along the inner wall of the cone strikes against the front concave face of the plate 10, and is thereby deflected outwardly and forwardly against the outer wall of the cone, so that the force and gravity of the water is concentrated in each cone, and any retarding effect due to the backflow is overcome by the forward deflection of such backflow by the concave face of the deflector-plate. It will also be seen upon reference to the drawings that none of the water in the buckets is carried forwardly on the side of the wheel opposite to the inlet and is in reality discharged before the buckets reach the position in a vertical line directly under the axis, the water being taken in above and at one side of the axis and is discharged before it reaches the exhaust-opening directly beneath the axis, so that there is no back pressure at the exhaust, and no load of water is carried up on the side of the wheel opposite the inlet, but, on the contrary, a certain number of buckets on the side of the wheel toward the inlet are always filled with water and further increase the power of the motor.

This motor may be used for any desired purpose, but is especially adapted for operating the pneumatic devices of pipe-organs and similar devices requiring a constant uniform action.

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

1. In a water-motor, a rotary element and a series of conical buckets arranged circumferentially on the rotary element with their apexes in the direction of rotation, the apex of each bucket extending in the open end of the next preceding bucket and provided with an external annular flange.

2. A water-motor comprising a rotary element and a series of conical buckets arranged circumferentially upon the periphery of the rotary element and having their apexes pointing in the direction of rotation, the apex of each bucket projecting into the open end of the next preceding bucket and a concavo-convex plate surrounding the apex of each bucket and wholly within the open end of the next preceding bucket.

3. In a water-motor, the combination with a wheel having a series of conical buckets on its periphery with their apexes extending in the direction of rotation, and concavo-convex plates in the open ends of the buckets, but of less area than the cross-sectional area of said open ends.

4. A water-motor comprising a case having an inlet and an outlet, a wheel rotatingly mounted in the case, conical buckets mounted end to end on the periphery of the wheel with the apex of each projecting into the open end of the preceding bucket and provided with an external annular flange inclining forwardly from its junction with the bucket.

In witness whereof I have hereunto set my hand this 29th day of February, 1904.

HENRY A. HISCOX.

Witnesses:
H. E. CHASE,
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