J. M. CHRISTOFFEL.

FLUID MOTOR.

APPLICATION FILED MAR. 21, 1913.

1,108,700.

Patented Aug. 25, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

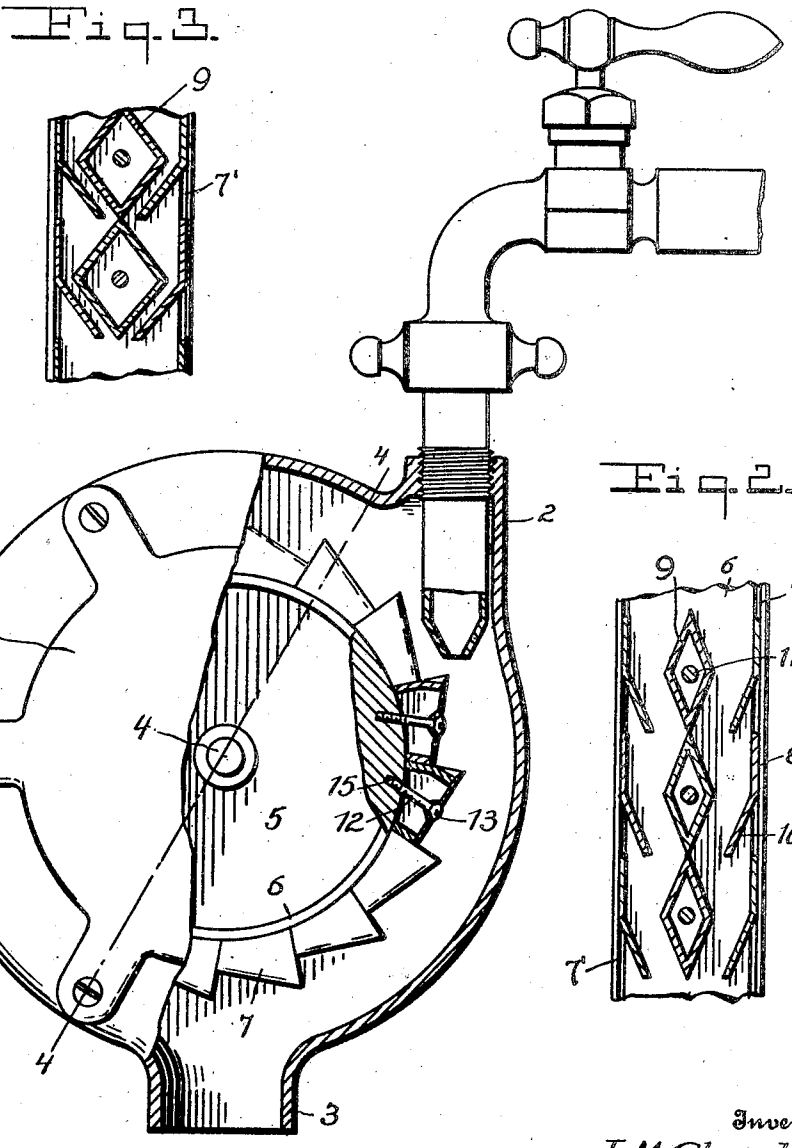


Fig. 3.

Fig. 2.

Witnesses

O. M. Jones.

C. L. Landon.

Inventor

J. M. Christoffel

By A. Randolph Jr.

Attorney

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2 SHEETS—SHEET 2.

Fig. 4.

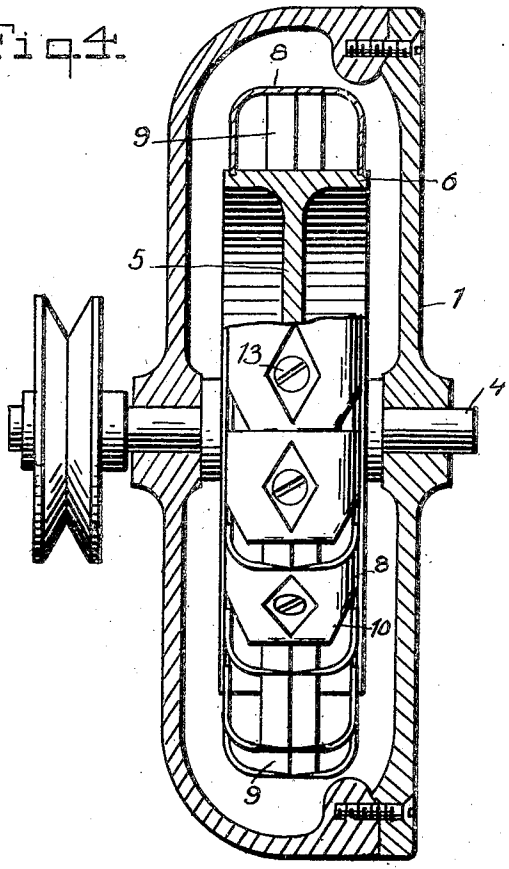


Fig. 6.

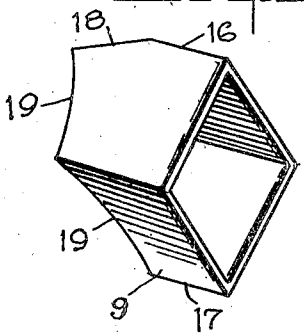


Fig. 7

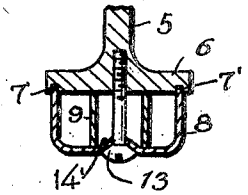


Fig. 8.

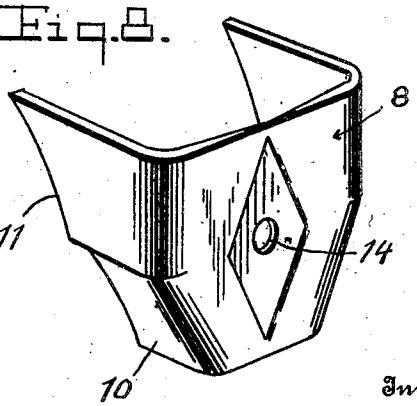
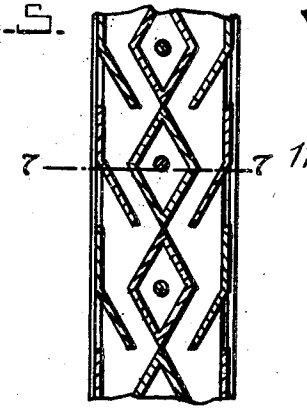


Fig. 5.



Witnesses

R. H. Jones.

A. L. Landon.

Inventor

J. M. Christoffel.

By V. Randolph Jr.

Attorney.

UNITED STATES PATENT OFFICE.

JOHN M. CHRISTOFFEL, OF MILWAUKEE, WISCONSIN.

FLUID-MOTOR.

1,108,700. Specification of Letters Patent. Patented Aug. 25, 1914.

Application filed March 21, 1913. Serial No. 755,996.

To all whom it may concern:

Be it known that I, JOHN M. CHRISTOFFEL, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Fluid-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.

This invention relates particularly to fluid motors and has particular reference to new and useful improvements in that type of water wheel known as bucket rotors.

As its principal object this invention aims to increase the efficiency of bucket water wheels by providing a simple and practical motor designed with such regard to proportion, number and arrangement of parts that the waste of pressure and the power transmission is guarded against by successively impinging each unit of fluid volume against a number of rotor buckets.

A still further object of this invention contemplates the provision of a light and efficient fluid motor which may be readily attached to any standard form of water spigot or hydrant.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

With reference to the drawings, wherein I have illustrated the preferred embodiment of my invention as it is reduced to practice, and throughout the several views of which similar reference numerals designate corresponding parts: Figure 1 is a side elevation of the motor illustrated in assembled relation to a water faucet, parts of the casing being broken away to more clearly disclose the assembled relation of the interior parts. Fig. 2 is an edge view of the rotor showing the buckets in section. Fig. 3 is a modified form of the elements illustrated in Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 1. Fig. 5 is an additional modified form of the features illustrated in Fig. 2. Fig. 6 is a detail view in perspective of one of the bucket baffle cores. Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 5. Fig. 8 is a detail perspective of one of the buckets in dissembled position.

Proceeding now to the description of the drawings, the preferred form of my invention includes a motor casing 1, provided with the customary tangential internal screw threaded attaching nipple 2, and an outlet port 3. Keyed on a concentric shaft 4 journaled at diametrically opposed openings in the walls of the casing 1 is the rotor of my invention which includes a rotor disk 5 on the periphery of which is formed a double laterally projecting circumferentially extending flange 6, to the outer face of which are secured the buckets designated as entireties in Fig. 1 by the numeral 7. Each bucket member is formed of two elements, an outer bucket casing 8 and a cross sectional diamond-shaped baffle core 9. The bucket casings 8 are preferably made of sheet metal of any suitable nature and are formed in the nature of cross-sectionally U-shaped casings, the side walls 10 of the casing being directed inwardly and angularly at their lower end, producing a substantially funnel-shaped escape port for each bucket.

In mounting the bucket casings 8 on the flange 6 it has been found desirable to provide the flange 6 with spaced grooves 7′ disposed to receive the curved edges 11 of the casing. Each of the buckets 8 are preferably provided with centrally located apertures 14, the use of which will be more fully hereinafter described. The area of the surface of the bucket casings 8 immediately adjacent the aperture 14 is preferably depressed as clearly illustrated at 14′ to act as a support for the core 9. The baffle core 9 is made preferably hollow, and it is important that said core be diamond-shaped in cross section as will be hereinafter disclosed. The inner edges of the member 9 are curved to correspond with the curvature of the flange 6. The baffle core 9 is formed of a single sheet of metal bent to form prefer-

ably a diamond shaped member. The rear edge 16 of the core is shown to be longer than the front edge 17 thereof, a portion of said rear edge being parallel with the front edge, the remaining portion 18 of the rear edge being bent at an obtuse angle corresponding with the rear edge of the bucket casing. The inner edges 20 of the core are adapted to conform to the curvature of the rotor 5. In assembling the entire bucket the member 9 is mounted in the desired position on the outer face of the flange 6 and the casing 8 is mounted with its curved edges seated in the grooves formed in the member 6, after which a bolt 12 provided with the customary head 13 is passed through a suitable apertured depression 14 formed in the front portion of the casing 8, the bolt being then directed through the member 9 and subsequently screw threaded into a suitable bore tapped in the member 5, as illustrated at 15 in Fig. 1.

In the modification of the bucket structure illustrated in Figs 3 and 5, it will be observed that the one point of difference in the formation of the buckets resides in the fact that the angular relation of the converging portion of the walls 10 of the casing 8 and the angular relation of the sides of the baffle cores 9 is varied for a purpose to be hereinafter clearly disclosed.

The actual structure of the motor being thus disclosed it now remains to describe the operation of the device and to enumerate the peculiar advantages resulting from the novel bucket structure of this invention.

Briefly the operation is as follows: The water issuing from the nozzle of the faucet is ejected into the adjacent bucket striking the upper apex of the baffle 9, and the water being thus divided impinges first upon the upper adjacent walls of the baffle and then on the converging walls 10 of the casing. It will thus be seen that in each bucket there are four points of impingement for each unit of fluid volume which is ejected into the motor. The utilization of the fluid does not terminate at this point, however, for as the fluid strikes the converging walls of the casing of the first bucket it is directed against the upper diverging walls of the next adjacent diamond-shaped baffle, being thence deflected to impinge against the converging walls 10 of the casing of the second bucket. Each unit of water is thus subjected to contact with a number of buckets 7, inasmuch as the water will continue to act in rotating the wheel 5 by pressure upon the buckets 7 until each volume unit has traveled through as many buckets as are necessary to absorb all of the incoming fluid. It will also be observed that this peculiar design of bucket provides an effective means for absorbing and transforming a maximum amount of water pressure as the pressure in the nozzle is increased. This feature is believed to be an essential one and as such it is desirable that particular emphasis be laid upon it.

From the foregoing disclosures it is apparent that this invention provides a simple yet efficient fluid motor affording maximum utilization of each pressure unit of the incoming fluid by permitting the stream of water to play successively upon a number of buckets.

In reduction to practice, I have found that the form of my invention, illustrated in the drawings and referred to in the above description, as the preferred embodiment, is the most efficient and practical; yet realizing that the conditions concurrent with the adoption of my device will necessarily vary, I desire to emphasize the fact that various minor changes in details of construction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of my invention, as defined in the appended claims.

What is claimed is:

1. In a fluid motor, a rotor, a plurality of buckets mounted on said rotor, and a plurality of detachable baffle members mounted within the buckets for deflecting a fluid injected therein.

2. In a fluid motor a rotor, a plurality of buckets mounted on said rotor, a plurality of detachable baffle members mounted within the buckets for deflecting a fluid injected therein, and means for securing said baffle members to the buckets and to said rotor.

3. In a fluid motor a rotor, a plurality of buckets mounted on said rotor, a plurality of detachable members mounted within the buckets for deflecting a fluid injected therein, the buckets being provided with depressions adapted to support said baffle members, and means for securing said baffle members to the buckets and to said rotor.

4. In a fluid motor a rotor, a plurality of buckets mounted on said rotor, a plurality of detachable baffle members mounted within the buckets for deflecting a fluid injected therein, and screw threaded bolts passing through said buckets and the baffle members and engaging said rotor.

5. In a fluid motor a rotor, a plurality of buckets mounted on said rotor, a plurality of hollow detachable baffle members mounted within said buckets for deflecting a fluid injected therein, the buckets being provided with apertured depressions for supporting the baffle members, and means for securing said baffle members to the buckets and to said rotor.

6. In a fluid motor a rotor, a plurality of buckets mounted on said rotor, a plurality of hollow detachable baffle members mounted within said buckets for deflecting a fluid injected therein, the buckets being provided with apertured depressions for supporting the baffle members, screw threaded bolts passing through said apertured depressions, and the baffle members being threaded in engagement with the rotor.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN M. CHRISTOFFEL.

Witnesses:
H. O. WOLFE,
E. H. VAN DYKE.