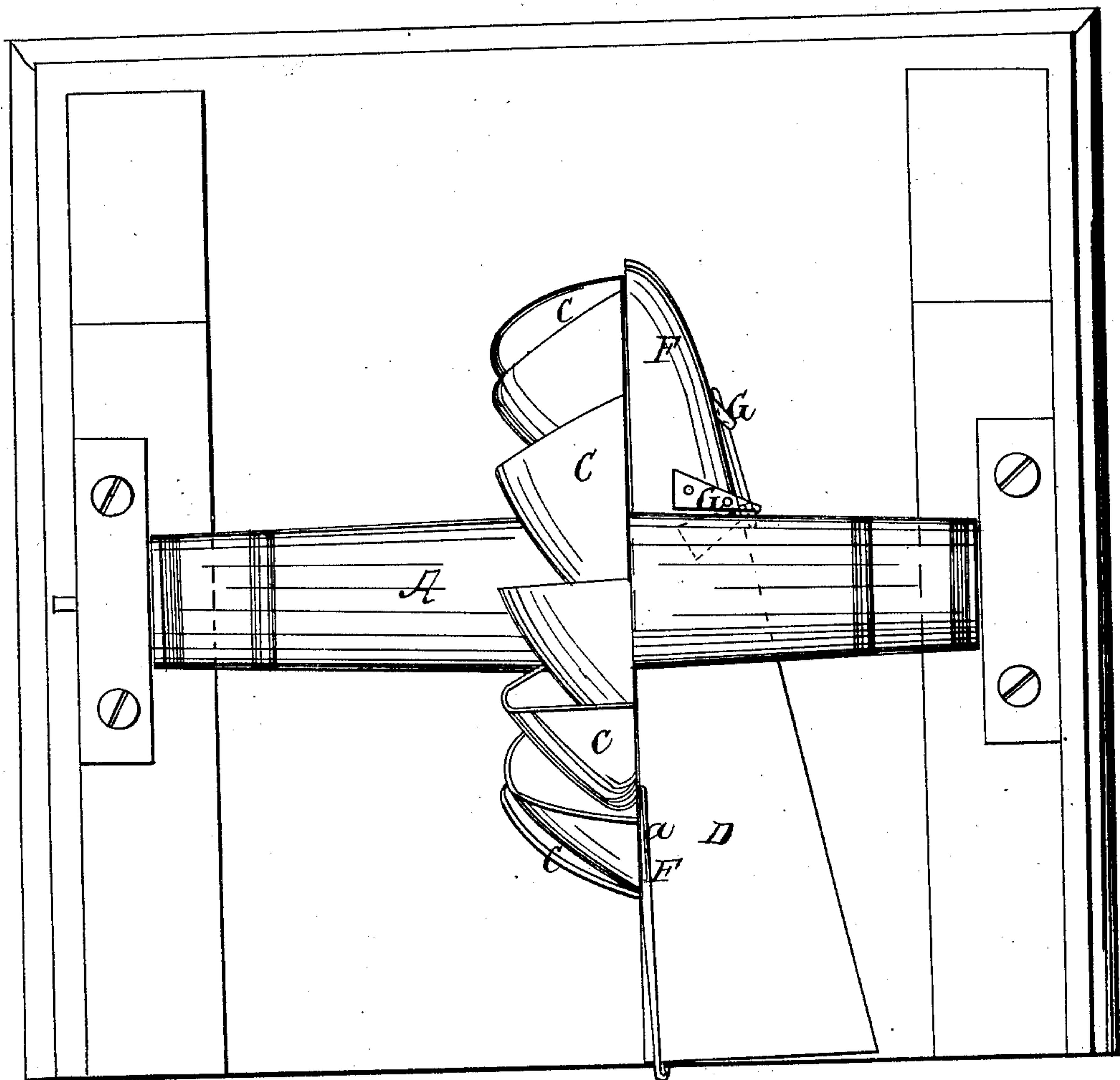


A. Whitman,
Turbine Water Wheel.
N^o 21,791. Patented Oct. 12, 1858.

Fig 1



UNITED STATES PATENT OFFICE.

ALDEN WHITMAN, OF AUBURN, MAINE.

WATER WHEEL AND CHUTE.

Specification of Letters Patent No. 21,791, dated October 12, 1858.

To all whom it may concern:

Be it known that I, ALDEN WHITMAN, of Auburn, in the county of Androscoggin and State of Maine, have invented a new and
5 useful Improvement on a Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings,
10 making a part of the specification, in which—

Figure 1 (in the original drawings) is a perspective view of said wheel and spout; Fig. 2, a longitudinal elevation of them;
15 Fig. 3, a transverse section of the same; Fig. 4, a reversed inside view of the wheel; Fig. 5 a face or inside view of a single bucket; Fig. 6 an end view of the same; Fig. 7, a view of the side which joins the nave; Fig.
20 8, a side view of the spout, opened to show the course of the water; Fig. 9 a top view as above; Fig. 10 a top view of a double bucket and a section of the spout for the same. The operation and construction being
25 similar to the single bucket, the concave curving toe piece not represented.

In the drawings, A, represents a shaft carrying the wheel B, *c, c, c*, its buckets. The number for a wheel depend mainly on
30 the extent of its diameter; arranged in the order as represented in the drawings, so that the interstice or opening between them at the interior region shall be of sufficient extent for the water to escape without any re-
35 sistance to the wheel; D, an inclined tapering spout conducting the water in a direct course upon the buckets on the under side of the wheel and in a direct line with its travel on the double bucket (Fig. 10) curv-
40 ing concentrically with the same about the length of one bucket at the aperture of discharge, E, being elliptical or circular for the double, and semielliptical for the single bucket and corresponds to that of the in-
45 gress of the buckets, having vertical planes when used upon a horizontal shaft at right angles to the axis of rotation.

The nature of the improvement consists, mainly, in the peculiar form of the buckets
50 as represented in the drawings, in which there are neither plane surfaces nor parallel or right lines contained in any part or portion, but are curvilinear throughout, therein presenting an appropriate surface in each,
55 to induce and combine in unity every action of water, its gravitating force aiding to

strengthen other forces, reversing the current of the water in passing from its position where it first unites with the current to that where the propelling power leaves it
60 in a central direction or to speak more definite and practical in reference to the recipient buckets acting from their lowest ingress to their highest interior region first named. First by direct action and ending
65 by reaction in virtue of the centripetal force combining unity of action in a vertical, central direction acting upon a concave surface throughout slightly diverging from the head the outer edge of which is bent forward, a
70 little advance of a radial line, so as to give a lifting tendency in the direct action as is also by the reaction and also to prevent the water adhering thereto by escaping in a direct action as it rises above the terminus
75 of the spout its lateral portion presenting an appropriate surface for the action of the centrifugal force and also serving as eccentric rims to the forenamed passage.

The object of this construction and ar-
80 rangement of the wheel and spout is to gain the greatest per cent. of power in the use of the water and thereby overcome the greatest amount of friction, which "overcome is power gained" by bringing the action of the
85 water upon the bucket at the point specified above adds no friction upon the bearings and being the power of a projectile force hence the weight of power is obviated thereby. I would not be understood by
90 this as indorsing the erroneous opinion that in a perpendicular or breast pitch the gravitating force unites with velocity due to heads of twelve feet and upward its force under such heads can aid only to strengthen
95 other forces as a counterpressure and in this pitch the force of the current is easily destroyed in a small depth of back water take for an example the "Timothy Rose wheel" the water being brought upon its buckets in
100 curvilinear courses a portion of its power is therefor expended and the remaining force, be it more or less, acting upon the buckets, is directly upon the bearings and the aperture of their ingress and egress being upon
105 equal circles the action of the water can be rendered no more available upon the wheel when it has acquired its proper motion than when it is still and in the language of the inventor, by curving the chutes "that the
110 water may act centrifugally and strike the bucket at right angles &c." whereas I give

a direct course to the water, the buckets descending in a curving course to receive it (water) at right angles and acting centripetally adds no friction to the bearings and its loss of power, in back water, is small until the shaft is nearly immersed, as the discharge aperture of buckets and spout are in an ascending direction by which also the focus of action is brought upon the buckets at the central point before named, uniting with the current in such a manner, by its position and form, as not to shock its velocity as it descends and receives its full supply, the entire force, and the greatest impulse, and meets the primitive current at right angles thereto; the force of the impulse being augmented by the counterpressure contained in the weight of the column in the vertical section of the buckets; being constant, unremitting, and simultaneous in their operation, acting upon a concave passage throughout, to preserve the density and give firmness to the column, as the bucket, so to speak, turns down upon it, quickens the reaction of the water thereon, and causing a stronger direct action to be maintained at its periphery and being rendered more available thereon when the wheel is in action the water being discharged from the buckets at their interior region, before named. By this arrangement all practical fall upon other wheels becomes head over this wheel, one particular advantage over other wheels is its being peculiarly adapted to small streams.

I do not wish to limit myself to the quan-

tity of water to be used upon the wheel nor as yet can say in what quantity of water, and size of wheel, its greatest percentage of power may be found but say in brief that I have used both the single and double bucket with less than fifty square inches of water upon a wheel three feet, ten inches in diameter under heads of ten feet and upward "driving" and "up and down" saw in common sized logs two cuts to the inch and one hundred to the minute—having power to start of itself—runs with great steadiness under high heads—not easily affected by back water, nor liable to freeze up—requiring but little time and expense, no flume, nor apron, to set them, for running, wears slightly upon the boxes, and is easily kept in repair, in all respects.

I do not claim a center vent wheel as used by Dear S. Howard, John H. Gatiss, and others, nor do I claim the particular construction of the spout irrespective of its relative position, but

What I claim, is—

In the peculiar form of the bucket in conjunction with the corresponding form and relative position of the spout thereto in the manner described and for the purpose set forth in the foregoing specifications.

In testimony whereof I have hereunto set my signature.

ALDEN WHITMAN.

Witnesses:

PRENTISS M. WHITMAN,
R. BLACKER.