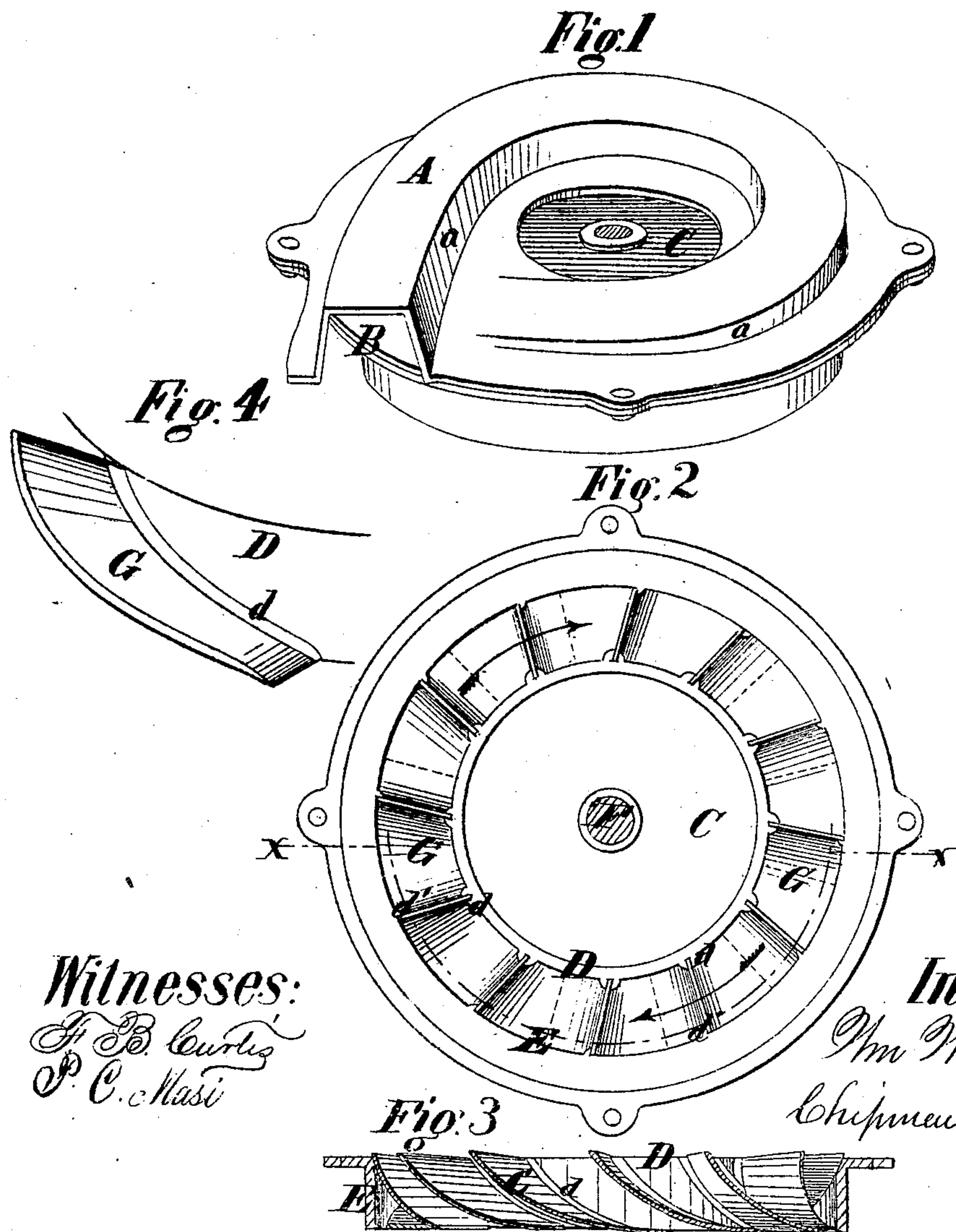


W. W. WEAVER.

Volute Chute for Water-Wheels.

No. 132,126.

Patented Oct. 8, 1872.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM WELLS WEAVER, OF ROSSIE, NEW YORK.

IMPROVEMENT IN VOLUTE CHUTES FOR WATER-WHEELS.

Specification forming part of Letters Patent No. 132,126, dated October 8, 1872.

To all whom it may concern:

Be it known that I, W. W. WEAVER, of Rossie, in the county of St. Lawrence and State of New York, have invented a new and valuable Improvement in Turbine Water-Wheels; 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 drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a perspective view of my invention. Fig. 2 is a top-plan view of the wheel. Fig. 3 is a vertical section on line *x x*, Fig. 1. Fig. 4 is an enlarged view, in perspective, of bucket.

This invention has relation to turbine water-wheels; and the novelty consists, first, in so constructing and arranging the buckets that when in position their upper edges shall be tangential and their lower edges radial with respect to the center of the wheel, so that the pressure of water may be directed to the outer parts of the buckets and the issue toward the center of the wheel; secondly, in constructing the rims of the wheel with curved flanges to receive the side edges of the buckets, so as to obviate the use of bolts or other like fastenings, as well as to increase the strength of the buckets; thirdly, in constructing the scroll, by means of which the water is conveyed to all the buckets of the wheel at the same time, with walls inclining outwardly from top to bottom, in order to increase the pressure of the water beyond its natural or ordinary power, resulting from its head, fall, &c., and thereby enhance the efficiency of the wheel.

In the accompanying drawing which illustrates this invention, A represents the scroll-flume, having the inclined walls *a* and mouth B. The water entering the latter is compressed not only by the general continuously-decreasing dimension of the scroll, but also by the contraction of its upper part by the incline of the walls outwardly from top to bottom, as shown. C represents the wheel-hub; D, its rim or periphery; E, the outer rim of the wheel; F, the shaft; and G, the buckets. The buckets are arranged between the hub C and the rim E, and are held in

place by the double flanges *d* on the periphery D, and the single flanges *d'* on the interior of the rim E. The curve of these flanges corresponds to the curve of the buckets, which, being constructed separately, are inserted by placing their inner edges between the double flanges and then pressing the buckets down until their under sides rest on the single flanges. The incline of the buckets is that of a graceful curve, concave at its upper end, and thence gradually changing to a convex, as shown clearly in Figs. 3 and 4. The lower edges of the buckets run radially with respect to the axial center of the wheel, while the upper edges run tangentially. This arrangement causes the pressure of water to be exerted against the face of bucket near the outer rim of the wheel, and gives to the issue-openings a tapering form, the widest part near the hub, thus causing the wheel to discharge toward the center and increasing the centrifugal force of the water. The convexity of the buckets at their lower ends is slight and on the upper surface only, the under surface being flattened so as to leave the issues clear and to present no projecting obstacles upon which the back water can have an effect so as to impede the progress of the wheel. The lines of the lower edges of the buckets are for the same reason made even with the under surface of the hub and outer rim. The upper edges of the buckets do not run exactly even with the upper surface of the wheel, but are higher near their outer than near their inner edges, so as to compensate for their tangential incline, and thus present a sufficient surface to the water.

I claim as my invention—

In a turbine water-wheel, the improved scroll-flume having the inner surfaces of its side walls inclined outwardly from top to bottom in such a manner that the width of the passage between said walls shall be greater at its lower than at its upper part, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in presence of two witnesses.

WILLIAM WELLS WEAVER.

Witnesses:

JAMES WALL,
WM. W. LEONARD.