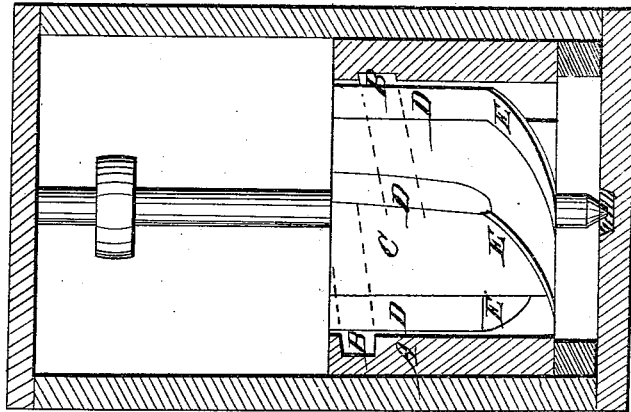


*P Wells,*  
*Water Wheel.*

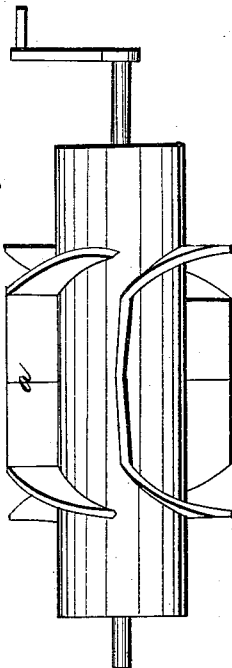
*N<sup>o</sup> 2989.*

*Patented Mar. 4, 1843.*

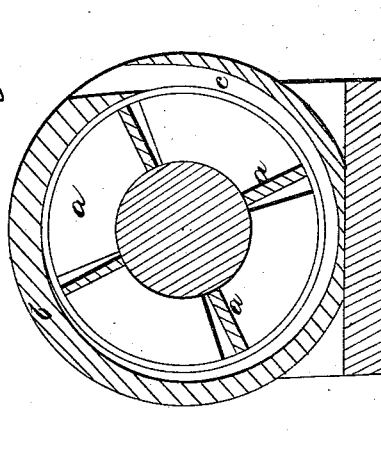
*Fig. 1*



*Fig. 3.*



*Fig. 2*



# UNITED STATES PATENT OFFICE.

PHILIP WELLS, OF MILFORD, MICHIGAN.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 2,989, dated March 4, 1843.

### *To all whom it may concern:*

Be it known that I, PHILIP WELLS, of Milford, in the county of Oakland and State of Michigan, have invented a new and useful Improvement in Water-Wheels, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a vertical section of a vertical wheel and case surrounding it. Fig. 2 is a cross-section of a horizontal wheel and case surrounding it. Fig. 3 is a side view of the horizontal wheel.

Similar letters refer to corresponding parts.

The nature of my invention and improvement consists in forming the curb with a spiral gradually-diminishing passage or water-way on the inside thereof, the small end of said spiral way terminating vertically under the large end or entrance, thus constructed for the purpose of conducting the water to the buckets of the wheel in a spiral wedge-shaped column, that one portion of the stream shall not interfere to impede the velocity of the other portions of the stream in passing to the several buckets of the wheel, and in so placing the buckets that the upper portions of them acted on by the percussion of the fluid shall receive the water at right angles to its direction and the lower portions acted on by reaction.

Inside of the case or curb surrounding the wheel of the form represented at A in Fig. 1 is formed a spiral passage or water-way B, commencing at the top of the curb and extending in a spiral direction once around the inside of the curb and gradually diminishing in its depth. Inside of this spirally-grooved curb is arranged the wheel C, which is fastened on a vertical shaft turning in the usual step and frame. On this wheel are fastened equidistant from each other four or more plain buckets D, which extend from the top of the wheel downward in a spiral direction about three-fourths its length in such a manner that the water passing through the scroll or water-way B will strike them at right angles. The remaining portion of the wheel below the

buckets D is occupied by concave buckets E, extending from the bottom of the buckets D in a spiral direction to the bottom of the wheel, so as to present a surface at right angles with the line of the shaft of the wheel.

The water is admitted into the curb in which the wheel stands at the top on one side, running around the wheel in the scroll-water B in a spiral direction, so as to pass when once around under the mouth or entrance of the water-way. The scroll B, as before stated, diminishes in depth as it extends around the curb. Commencing as it enters the curb at three-fourths of a column of water, the remaining one-fourth strikes the first bucket. The scroll diminishing in depth regularly to a point when once around, the remaining three buckets each receive an equal share of the three-fourths, so that each bucket receives the same quantity of water. The water passing around the curb is directed downward so as to pass under the entrance of the stream, that as it first enters and continues to move in a spiral direction around the wheel it cannot come in contact with any part of itself. Thus whether the speed of the wheel is rapid or slow the effective force of water applied will always be realized.

When it is intended to use the wheel in a horizontal position; it is provided with a double set of buckets *a* and surrounded by a similarly-constructed curb or case *b* as the one above described, with two diverging spiral scrolls *c*, formed on the inside near the center, as seen at Figs. 2 and 3.

What I claim as my invention, and which I desire to secure by Letters Patent, is—

1. Constructing the curb with a spiral tapered water-way on the inside thereof, in the manner and for the purpose set forth.

2. In combination therewith, arranging the buckets D on the wheel C in the manner and for the purpose set forth.

PHILIP WELLS.

In presence of—  
AUGST. BALDWIN,  
JOH. AUSTIN.