

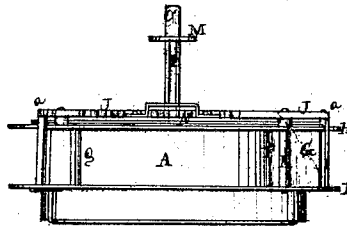
*A. P. Teachout,*

*Water Wheel.*

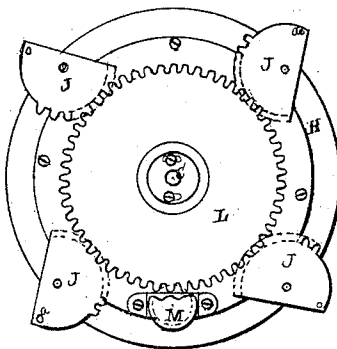
*No. 108209.*

*Patented Oct. 11. 1870.*

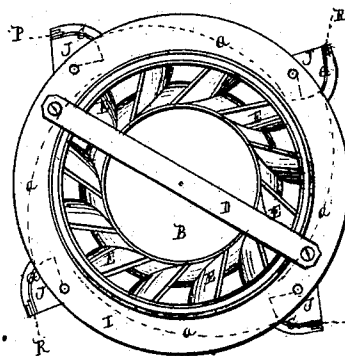
*Fig. 1.*



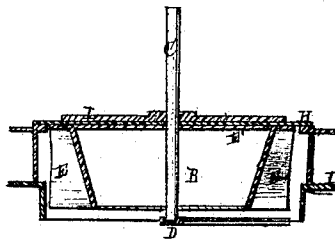
*Fig. 2.*



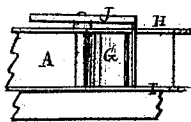
*Fig. 3.*



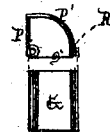
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Inventor.*

*A. P. Teachout*  
*J. H. Burridge & Co*  
*Attorneys*

*Witnesses.*

*J. H. Burridge*  
*D. L. Humphrey*

# United States Patent Office.

ALBERT P. TEACHOUT, OF MADISON, OHIO.

Letters Patent No. 108,209, dated October 11, 1870.

## IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

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

Be it known that I, ALBERT P. TEACHOUT, of Madison, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Water-Wheels, of which the following is a description.

Figure 1 is a side view of the wheel.

Figure 2, a view of the upper side.

Figure 3, a view of the under side.

Figure 4, a vertical transverse section.

Figure 5, a detached section.

Figure 6, a view of a gate.

Like letters of reference refer to like parts in the different views.

The nature of this invention relates to the buckets of a water-wheel of the turbine class, the object in view being to so construct the buckets of said wheel that they shall have a larger discharging capacity than those in ordinary use.

It also relates to the gates of the wheel, they being so constructed and arranged that the water is admitted to the wheel at several points simultaneously, and all in one direction, so that its action upon the wheel shall be direct and of equal force, as herein-after more fully described.

In the drawing, fig. 1—

A represents a case or curb, in which the wheel B, fig. 3, is hung on the shaft or spindle C, fig. 4, having its end bearing in a step secured to the cross-piece D, fig. 3.

It will be observed that the hub or core of the wheel is of a conical form, the upper diameter of which being considerably larger than the lower one, as will be seen in the transverse section, fig. 4.

On the face of the hub or core is arranged a series of wings or buckets, B, having a winding direction around it, or relatively to its axial line, and which are also slightly curved longitudinally.

It will be observed that said buckets do not project radially from the hub or core, but obliquely therefrom, so that they have an inclining position toward each other, as shown in fig. 3.

It will also be observed that the upper side of the wheel is covered by a disk, E, fig. 4, the margin of which projects beyond the core to the extreme edge of the wings, thereby covering them and the spaces between, the purpose of which will presently be shown.

In the core, on four opposite sides of its diameter, are openings or gateways, one of which is shown at F, fig. 1; said gateways are closed by the gate G, pivoted in the top H and flange I of the core, and between which it swings for closing and opening the ways, and which is done by the segmental gear J, secured to the upper end of the pivoted shaft K, on which the gate swings.

Said gear is operated by the toothed wheel L, in which the four segmental gears engage, and whereby the several gates are actuated simultaneously for opening and closing the gates, the outer end of the gate being attached to the segment at or near its periphery, as seen at the point a, fig. 1, so that the segment acts as a lever upon the outer end of the gate, thereby actuating it easily and readily, the wheel L being actuated by the hand-wheel and pinions M N, secured to the ends of the shaft O.

It will be seen, on referring to fig. 3, that the gate is curving from its connection with the segment at the point a inwardly to its connection with the pivotal shaft to which it is attached by means of a radial wing or plate, P', fig. 6, which, when the gate is shut, closes the opening or water-way, whereas the curving part of the gate falls back against the rear side of the openings or chutes at the point Q, fig. 1, thereby closing them, and which is made secure from leakage by a packing of rubber, R, fig. 3, or other suitable material, secured to the outer end of the gate, and which falls closely against the rear edge of the chute.

The advantages resulting from a wheel constructed and arranged as above described are, viz., by giving to the side A of the case a spiral curving direction, as indicated by the dotted lines a, fig. 3, the water is caused to impinge upon the wheel nearly in the line of its rotation; hence a more direct action of the water in the line of movement is obtained than if the water impinged upon the wheel at an approximate radial line, which would be the result if the side of the case was not thus spirally inclined; also, each gate opens exactly in the same direction, and of an equal extent and simultaneously, at all four points; therefore, the water from each gate acts equally upon the wheel in one direction, or at the same angle; hence there is no loss in the effective force of the water upon the wheel by impinging upon it at various angles, as is the case when let upon the wheel in the ordinary way.

In consequence of covering the upper ends of the buckets or wings by the disk S, the water, as it impinges upon the wheel, strikes the under side of the disk; also, the side of the core, the result of which is to lift the wheel, thereby releasing the step from much of the weight of the wheel while it is in operation.

A further advantage obtained in this wheel consists in facilitating the escape of the water from the wheel, and which I accomplish by increasing the area of the space between the wings or buckets at the lower side of the wheel. This is done by giving the core a conical form, the shortest diameter of the bore being that of the lower side; hence, the water will be dis-

charged from the wheel with greater freedom than if the core was of an equal diameter throughout in length, and, therefore, little or no obstruction of spent water will embarrass the revolution of the wheel.

By giving to the buckets a spiral and curving position, as above described, the water, as it impinges upon them, has a stronger hold upon the wheel, and, therefore, exerts its full force upon it.

As above remarked, the gate is made curving, as shown in fig. 6, thereby presenting its concave face toward the in-flowing stream. To prevent any eddying or counter-current of the water, the concave of the gate may be closed up, and thereby prevent any such like result.

*Claim.*

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

A water wheel, when constructed with an inverted conical hub or core B, spirally curving wings or buckets E, and top or cover E', substantially in the manner as described, as and for the purpose set forth.

ALBERT P. TEACHOUT.

Witnesses:

J. J. MITCHELL,  
HORACE ALVORD.