

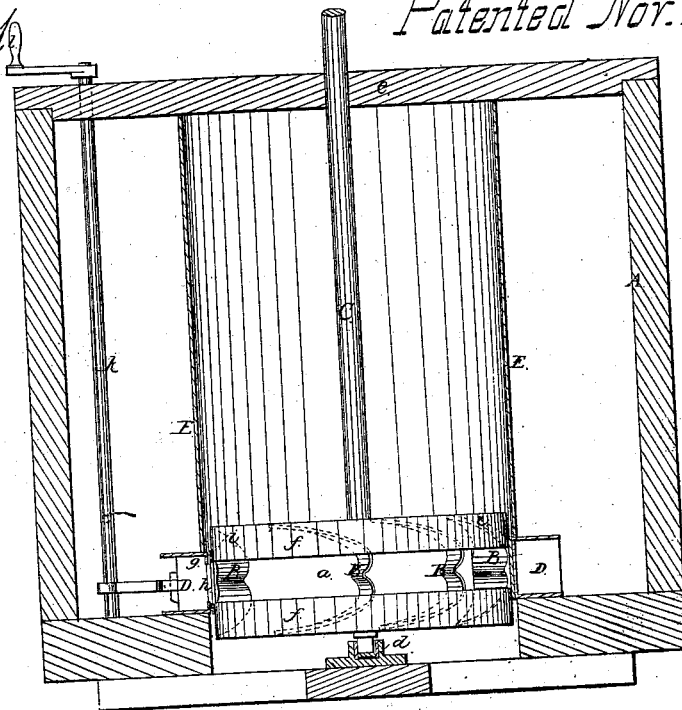
*Weed & Marr,*

*Water Wheel;*

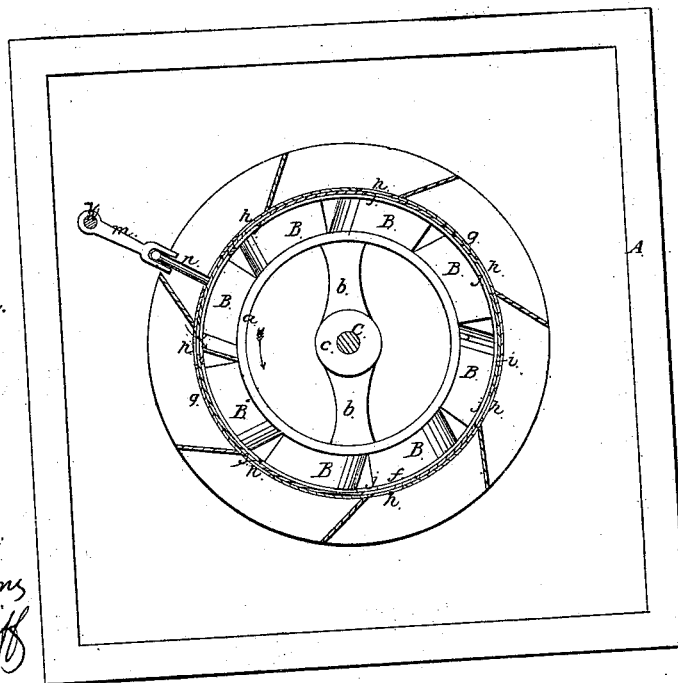
*Patented Nov. 15, 1864.*

*No 45,106*

*Fig. 1.*



*Fig. 2.*



*Witnesses:  
Henry Morris  
G. L. Topliff*

*Inventors.  
C. Weed  
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Attys*

# UNITED STATES PATENT OFFICE.

CHARLES WEED AND WILLIAM C. MARR, OF EL DORADO, IOWA.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 45,101, dated November 15, 1864.

*To all whom it may concern:*

Be it known that we, CHARLES WEED and WILLIAM C. MARR, both of El Dorado, in the county of Fayette and State of Iowa, have invented a new and useful Improvement in Water-Wheels; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a vertical central section of our invention. Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in the two views.

This invention consists in a water-wheel with buckets shaped with a projecting center and recurved receding wings, as represented in the drawings, and receiving water in the center in such a manner that the water strikes the bucket direct, and afterward passes off above and below, and produces motion by reaction upon the upper and lower extremities of the buckets, the amount of water on the wheel being gaged by an adjustable rotary gate and chutes.

To enable others skilled in the art to fully understand and construct our invention, we will proceed to describe it.

Our wheel consists of a central tube or cylinder, *a*, open at both ends, and provided with two or more arms, *b*, radiating from the hub *c*, in which the shaft *C* is secured. This shaft is placed in a vertical position, as shown in Fig. 1, and it is stepped into a socket, *d*. It extends through a bridge-tree, *e*, fastened across the flume *A*, and it transmits the motion and power of the water-wheel to the working machines in the usual manner.

*B* are the buckets, which are shaped with a projecting center and recurved receding wings, as represented in the drawings, and made of sheet metal or any other suitable material, and secured to the outside of the cylinder *a*. The ends of these buckets, above and below, are protected by rings *f*, each of which takes up about one third (more or less) of the entire height of the wheel, leaving the central part of the buckets exposed, as clearly shown in Fig. 1 of the drawings.

The rings *f* fit into a cylindrical case, *g*, made of sheet metal or other suitable material. This case is provided with apertures

*h*, communicating with the chutes *D*, and it is secured in the lower part of the flume *A*, and firmly connected to a cylinder, *E*, which protects the water from passing to the wheel through any other channel besides the chutes.

Between the case *g* and the wheel is the gate *i*, which is made of a cylindrical ring fitting nicely into the case, and also to the outside surface of the rings *f*, and provided with orifices *j*, which can be brought in such a position that they register with apertures *h* in the case, or, by turning the gate, said apertures can be partially or wholly closed, as may be desirable.

The gate *i* is operated by a vertical shaft, *k*, which extends up through the flume, and bears a handle, *l*, for the purpose of imparting to it the desired rotary motion. From the lower end of this shaft extends an arm, *m*, the forked end of which catches over a stud, *n*, secured to the gate, as clearly shown in Fig. 2. By turning the shaft *k* the gate can be moved in either direction, and it must be remarked that in large wheels the gate will be operated by means of a toothed segment and pinion, or in any other suitable manner, and we do not wish to confine ourselves to any peculiar mechanism for operating the gate, but reserve the right to change this portion of our wheel as circumstances may require.

On turning the gate so that the apertures *h* are partially or wholly opened, the water strikes the buckets direct in the center, and thence it branches off in two currents, one branch passing up and the other down, and both giving motion to the wheel by reaction, one on the upper and the other on the lower part of the buckets.

By this arrangement the quantity of water admitted to the buckets can be regulated at pleasure, and, if desired, a much larger quantity of water can be admitted to the wheel than with wheels of the ordinary construction, and the influence of a diminished head by backwater can be counteracted. The water passes from the wheel without coming in contact with the back of the buckets, and it acts on the wheel with the best possible effect. The rear of the recurved wing, being in advance of the forward point of the succeeding bucket, allows the water free passage without press

ing against the convex side of the following bucket.

What we claim as new, and desire to secure by Letters Patent, is—

A water-wheel provided with buckets B, with a projecting center, and recurved receding wings, as represented in the drawings, and operating in combination with the rings f

and central rotary gate, i, in the manner and for the purpose substantially as herein shown and described.

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Witnesses:

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