

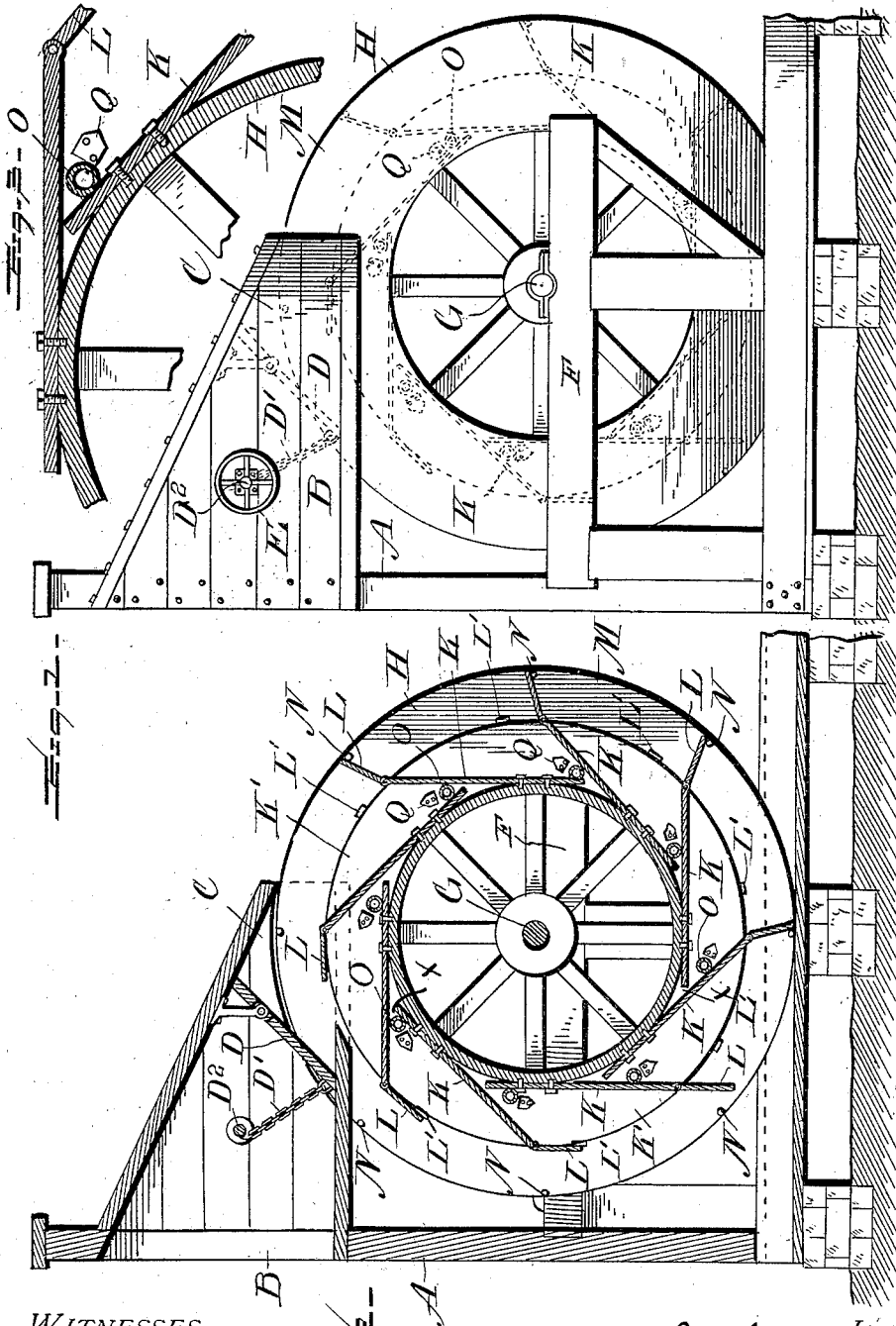
No. 705,087.

Patented July 22, 1902.

J. W. HOUTZ.  
WATER WHEEL.

(Application filed Mar. 29, 1902.)

(No Model.)



WITNESSES:

*Wm. F. Day*  
*A. L. Hughes*

INVENTOR

*John W. Houtz*  
By *Franklin N. Hough*  
Attorney

# UNITED STATES PATENT OFFICE.

JOHN W. HOUTZ, OF REPUBLIC, MISSOURI.

## WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 705,087, dated July 22, 1902.

Application filed March 29, 1902. Serial No. 100,583. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. HOUTZ, a citizen of the United States, residing at Republic, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Water-Wheels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in overshot water-wheels adapted for use at low-pressure heads of water; and it consists in the provision of a wheel having a series of buckets, each bucket having a space intermediate the inner end of one bucket and the broad face of the wall of the adjacent bucket, in which space air is trapped and the entrance to which space is automatically closed by means of a rolling tubular valve when the bucket is being filled with water, said valve thus preventing water entering the space and reducing the tendency to a vacuum and the resulting hindrance to the free discharge of water therefrom during the emptying of the bucket.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings similar letters of reference indicate like parts in the several views, in which—

Figure 1 is an end elevation of my invention and crib about the same. Fig. 2 is a cross-sectional view centrally through the wheel, showing the hinged wings and the valves in section in the bottoms of the buckets; and Fig. 3 is an enlarged detail in perspective, showing one of the valves located in the bucket.

Reference now being had to the details of the drawings by letter, A designates the frame of a crib, which crib is adapted to partially surround the wheel, and the runway B is provided with an inclined upper wall, whereby the current of water may be directed to the buckets which are to be filled by the inflowing water. The portion of the crib ad-

jacent to the buckets which are filled is closed, as shown at C in Fig. 1 of the drawings, whereby the water is confined in the buckets on the downward throw of the wheel. A suitable gate D is provided in the runway, which is connected, by means of a chain D', with a shaft D<sup>2</sup>, which is rotated by means of a hand-wheel E, which is journaled in the opposite side walls of the runway, as shown. Mounted on the cross-beams F of said frame is a shaft G, suitably journaled, which shaft carries the overshot water-wheel H, which has a series of stationary buckets K about its periphery and flanged ends K', closing the ends of said buckets. Pivoted to each free longitudinal edge of the buckets K is an extension-wing L, each of which is adapted to fall against a stop L', which is positioned adjacent to the rim of said flange to limit the inner throw of said wing. Stops N are also provided about the rim M, against which stops N said wings are adapted to contact to limit the outer throw and in which positions said wings are held when the buckets are filled with water and on the downward movement of the weighted portion of the wheel. Intermediate the inner end of each stationary bucket and the wall of an adjacent bucket is left a space, which is closed by means of a tubular valve O when the bucket is filled with water, thus preventing water entering said space, and when the wheel turns sufficiently for the buckets to empty, said valve rolls by gravity against stops Q, and the air previously trapped in said space will reduce the tendency to the formation of a vacuum therein, which would result in a hindrance to the emptying of the buckets.

In operation when a current of water is directed against the buckets the hinged wings are thrown out to their farthest limit and beyond the ends of the fixed portions of the buckets, thus increasing the area against which the force of the water is directed and utilizing the force of the water beyond the fixed buckets. When a bucket is in position to fill with water, the valve therein will have rolled by gravity to a position to close the space intervening between the inner end of the bottom of the bucket and the broad face of an adjacent bucket, trapping air in said space and preventing water entering the same, and will hold the air in said space until the

bucket reaches a position where the water is discharged. While the bucket is discharging, the tubular-shaped valve will roll away from the space which it has closed, and the  
5 buckets will readily empty without the formation of a vacuum, which would have a tendency to form if the water were allowed to enter said space.

From the foregoing it will be observed that  
10 by the use of my invention I am able to utilize a low head of water by making the wheel of considerable length and of small diameter, and by the use of the extension-wings the weight of the water is thrown as far as possible from the center of the wheel contained  
15 in the buckets thereof and means provided for allowing the water to discharge from the buckets by the use of my improved valves.

Having thus fully described my invention,

what I claim as new, and desire to secure by 20 Letters Patent, is—

1. An overshot water-wheel having a series of stationary buckets, tubular valves, one positioned in each bucket, and stops for retaining said valves in the buckets, as set forth. 25

2. An overshot water-wheel having a series of stationary buckets, a space intervening between the inner end of each bucket and the wall of an adjacent bucket, and a tubular valve positioned in each bucket and adapted 30 to close said space while the bucket is being loaded with water, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. HOUTZ.

Witnesses:

J. P. HOWELL,

T. F. CRISWELL.