

United States Patent Office.

WILLIAM BLAKE, OF BUCHANAN, MICHIGAN, ASSIGNOR TO HIMSELF AND CHARLES H. PARKTON, OF SAME PLACE.

Letters Patent No. 109,170, dated November 15, 1870.

IMPROVEMENT IN WATER-WHEELS.

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

I, WILLIAM BLAKE, of Buchanan, Berrien county, State of Michigan, have invented certain Improvements in Water-Wheels, of which the following is a specification.

My invention relates to that class of water-wheels known as covered or turbine wheels; and

The first part of my invention consists in providing an air-chamber in the body of the wheel, which serves as a buoy to support a portion of the weight of the wheel, and thus reduce the friction on its bearings.

The second part of my invention relates to the manner in which the quantity of water admitted to the wheel is governed; and the object of this part of my invention is to so conduct the water to the wheel as that a small quantity of water will give as good results in proportion to the quantity used as when a greater quantity of water is employed.

In the accompanying drawing—

Figure 1 is a top view of the wheel.

Figure 2 is a top view of the same, with the deck removed, showing the chutes and position of the buckets.

Figure 3 is a vertical transverse section showing the interior of the wheel.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A represents the shaft of the wheel, which should be of iron and substantially made.

B is an air-tight cylinder forming the body of the wheel, and firmly attached to the lower end of the shaft A. To this cylinder a suitable number of buckets is attached. It will be seen that, as this air-tight cylinder is submerged, it will have a buoyancy nearly equal to the weight of water displaced by it, and, to a great extent, will reduce the friction on the bearings of the shaft A. The upper end of this air-tight cylinder is formed concave on the top, which prevents any contact with the deck of the wheel except at the periphery, which is beveled down to a thin edge, for the purpose of giving more space for the passage of water into chutes.

C represents the curb in which the wheel runs. This curb is introduced through the bottom of the flume, and rests on the flange D. This flange is made sufficiently wide to receive the chutes *a a a a*. These chutes are firmly attached to the flange D at their lower edges, and conduct the water in a horizontal direction and nearly on a tangent line to the circle of the wheel.

E represents the deck of the wheel. This deck is made of equal diameter with the flange D, and rests

on the upper edges of the chutes *a a a a*, to all or part of which it is attached in any suitable known manner, that may be readily detached for the purpose of removing the deck when required.

F represents the sleeve attached to the center of the deck, through which the shaft A passes. This sleeve projects above the deck, and forms a bearing for the traverse wheel G. This wheel rests on the deck, and is partially cogged on one side, and meshes with the cogs of the pinion H. This pinion has a fixed place on the deck E, and is attached to the shaft I. This shaft must be sufficiently long to reach above the surface of the water in which the wheel runs.

d d d represent pins projecting from the upper surface of the traverse-wheel G to receive the slotted arm *j*. These arms are attached at their outer ends to the pivots K K. To these pivots the shutters S S S are attached. The lower ends of these pivots pass loosely through the flange D, and the upper end is supported by the deck E, forming a hinged attachment for the shutters S at the mouth of the chutes *a*. These shutters are made wedge-shaped, and set with their thin ends inward, so as to encumber the water-passages as little as possible.

It will now be seen that if motion be given to pinion H that the wheel G, arms *j*, and shutters S will move, thus opening or closing the water-passages to the wheel at will.

It will also be seen that as the jet of water is passing to the wheel it will receive its direction mainly from the longer surface or front of the chutes *a*, so that a small quantity of water will be utilized as well as a greater quantity, as in all cases the water will be thrown to the outer extremities of the buckets T, or all the water may be shut from the wheel by turning the shutters in the position shown in dotted lines at R, fig. 2.

I do not confine myself to any particular form of buckets, but prefer that shown in dotted lines at T.

Having thus fully described my invention,

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

1. The air-tight cylinder having the concave top, as and for the purposes set forth.

2. The combination of the air-tight cylinder with the shaft A, buckets T, curb B, flange D, deck E, traverse-wheel G, chutes *a*, shutters S, pinion H, arms *j*, pivots K, and pins *d*, substantially as and for the purposes hereinbefore set forth.

Witnesses:

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