

UNITED STATES PATENT OFFICE.

JAMES PLATT, OF UTICA, NEW YORK.

IMPROVED WATER-WHEEL.

Specification forming part of Letters Patent No. 39,832, dated September 8, 1863; antedated October 17, 1862.

To all whom it may concern:

Be it known that I, JAMES PLATT, of Utica, in the county of Oneida and State of New York, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my invention, taken in the line $x x$, Fig. 3. Fig. 2 is a plan or top view of the same; Fig. 3, a horizontal section of the same, taken in the line $y y$, Fig. 1; Fig. 4, a horizontal section of a portion of the same, taken in the line $z z$, Fig. 1. Fig. 5 is a horizontal section of a portion of the same, taken in the line $z' z'$, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement in horizontal water-wheels of that class in which sliding buckets are employed; and it consists in constructing and arranging the buckets in such a manner that they will yield or give in case of any foreign substances—such as drift-wood, &c.—entering the case of the wheel, and prevent the latter being injured thereby.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the case of the wheel, which is of cylindrical form, and is supported in a horizontal position by any suitable framing.

B represents the wheel, which is formed of a cylindrical rim or band, a , having two chambers, $b b$, within it at opposite points of its center, as shown clearly in Fig. 3. These chambers are connected at their inner ends, as shown at c , and serve as a means to connect the wheel to its shaft C. The spaces $d d$, between the chambers and the rim or band, are open at top and bottom. The chambers $b b$ are of cycloidal form, as shown in Fig. 3, and in each chamber, at its outer edge, there is placed a vertical shaft, D, to which a curved bucket, E, is attached by an arm, e . The curvature of the buckets E corresponds to that of the sides of the chambers $b b$, and the buckets are allowed to work into and out from said chambers through openings f in the rim or band a . The wheel B is placed concentrically within the case A, and the outer ends of the buckets,

when in working position and acted upon by the water, are in contact with the inner surface of the side of the case A.

F represents the gate by which water is admitted into the case A, and G is an abutment which is placed within the case A at one side of the gate, the band a of the wheel being in contact with the inner edge of the abutment, as shown in Fig. 3. The abutment G is between the induction-opening of the case and the eduction-opening g thereof.

To the upper end of each bucket-shaft D, above the wheel B, there is permanently attached a sector-shaped box, H, and within each box H there is placed an arm, I. These arms are placed loosely on the shafts D, and they have each a friction-roller, h , at their outer ends, which are fitted in a grooved stationary cam, J, above the wheel B. (See Figs. 1 and 2.) In each box H there is also placed an arm, K. These arms are also fitted loosely on the shafts D, and the outer end of each arm K has a curved projection, i , between which and a curved projection, j , on the arm I, there is placed a spiral spring, L. (See Fig. 4.) The arms K also have each a flat spring, M, bearing against them. These springs M are attached to the boxes H, and the pressure of them against the arms K may be graduated as desired by means of screws k . The springs L M cause the arms I to bear against the back edges or sides of the slots l in the sides of the boxes H, through which slots the arms I pass. This is clearly shown in Fig. 4. The cam J is of heart shape, or approximates thereto, as shown clearly in Fig. 2, the flattened side m of the cam being opposite the abutment G and induction and eduction openings of the case A. The shaft C of the wheel B has its lower end fitted in a step, n , which has a center, o , at its bottom. On the upper part of said shaft there is placed loosely a box, N, in which an annular frame, O, is placed loosely, so that it may rotate freely within the box. Within this annular frame O there is fitted a series of conical rollers, p , (see Figs. 1 and 5,) said rollers having a radial position relatively with the shaft.

P is a collar, which is also secured on the upper part of the shaft C, just above the box N. This collar rests upon the friction-rollers p in the box N, and the latter is provided with flanges or ears g' , through which screws r

pass vertically and rest on the framing, the box N being adjusted by means of these screws. By this arrangement the center *o* in the step *n* is relieved of the weight of the wheel, and the latter is allowed to rotate with but comparatively little friction. The box N serves as a receptacle for oil, and the rollers *p* may therefore be always kept properly lubricated. This feature of the rollers *p*, however, forms no part of this invention.

The operation of the wheel is as follows: When the gate F is raised or opened, the water enters the case A and acts against the buckets E, the convex surfaces of which are exposed to the action of the water. The outer edges of the buckets are, while being acted upon by the water, kept in contact with the inner surface of the side of the case A by the springs L M, the rollers *h* of the arms I being in the circular part of the cam, J. When, however, each bucket arrives at the edge of the eduction-opening *g*, the roller *h* of its arm I enters the flattened part *m* of the cam J, and the box H is turned so as to draw the bucket connected with it within its chamber *b*, and allow the former to pass the abutment G. When the bucket has passed the abutment, the roller *h* of its arm I enters the circular part of the cam J, and the springs L M are allowed to throw the end of said bucket in contact with the inner surface of the side of the case, so that the water may act upon it.

As the wheel is provided with two buckets at opposite points, it will be seen that one

bucket is always in a working position within the case.

In case any foreign substances—such, for instance, as drift-wood—should enter the case A the buckets E are allowed to yield or give—that is to say, will be pressed inward or forced into their chambers *b*, so as to prevent the substance wedging between the inner surface of the side of the case and the ends of the buckets. The springs L M admit of this result, and not only serve as a protection to the buckets but also to the whole wheel. The curved form of the buckets greatly adds to the efficiency of this yielding movement, as owing to such form, any hard foreign substance striking them will have a tendency to force or press them into the chambers *b*.

I do not claim, broadly, a horizontal water-wheel fitted within a case and provided with sliding buckets and an abutment; but,

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The curved sliding buckets E E, connected to shafts D D, and arranged with springs, substantially as shown, to operate as and for the purpose specified.

2. The combination of the cam J and abutment G, when used in connection with the sliding or yielding buckets E E, arranged as shown and described.

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Witnesses:

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