W. W. CLEAVELAND.
Current Water-Wheel.

No. 210,184. Patented Nov. 26, 1878.

Fig. 1.

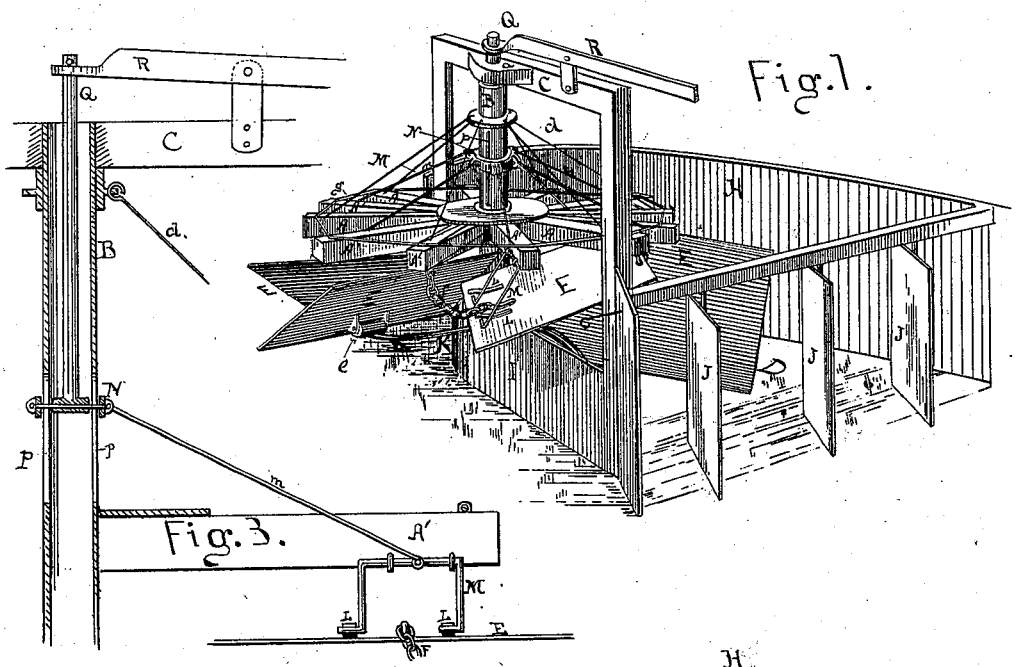

Fig. 3.

Fig. 2.

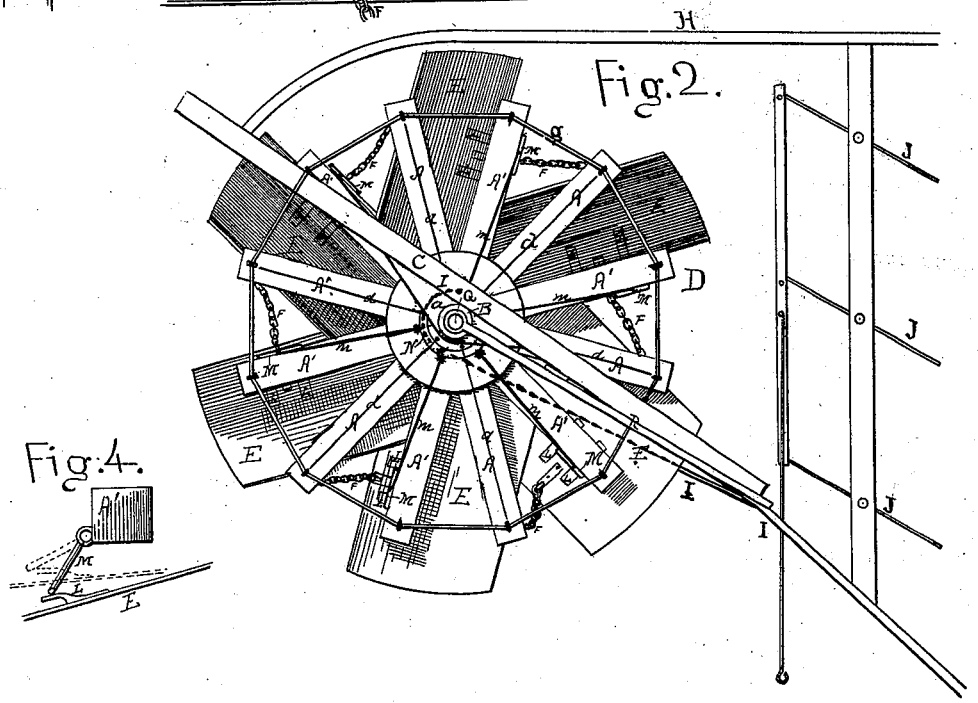

Fig. 4.

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Aug. L. Loisdale
D. P. Lowe

Inventor.
Wallace W. Cleaveland
By his atty
R. D. Smith

UNITED STATES PATENT OFFICE.

WALLACE W. CLEAVELAND, OF MARSHALL, MICHIGAN.

IMPROVEMENT IN CURRENT WATER-WHEELS.

Specification forming part of Letters Patent No. **210,184**, dated November 26, 1878; application filed May 2, 1878.

To all whom it may concern:

Be it known that I, WALLACE W. CLEAVELAND, of Marshall, in Calhoun county, in the State of Michigan, have invented new and useful Improvements on Current Water-Wheels, of which the following is a full and complete description, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective view of my wheel. Fig. 2 is a plan of the same. Fig. 3 is a vertical section. Fig. 4 is an end elevation, showing the action of the latches.

This invention relates to improvements on the wheel for which Letters Patent were issued to me August 3, 1875; and consists, first, in devices for automatically catching up and holding the buckets or floats out of the water when it is desired to stop the wheel; second, in the devices for operating said catches through the wheel-shaft; third, in the extended bulk-head, whereby water is confined and directed upon the skirt of the wheel.

That others may fully understand the invention, I will particularly describe it.

The wheel is constructed with radial arms A A′ and a hollow central shaft, B, which stands vertically, and is provided with a suitable step at the bottom and a bearing, *a*, in a supporting-frame, C, which spans the frame D, through which the water is directed.

The floats or buckets E are flat plates, of oblong form and parallel sides, and suitably hinged at one edge to the arms A. Their free edges are attached to said arms, other than those bearing the hinges, so that said floats drop down and hang from the hinged edge in a position nearly vertical, or are raised up to a position substantially horizontal.

The chains F are not employed for the purpose of so raising the floats in the structure of the wheel shown, though they may easily be arranged to do so.

The water is directed upon one side of the wheel by the bulk-head H on one side and a similar bulk-head, I, on the other side, constituting the flume D, and may be cut off entirely by swinging gates J.

The shaft B stands close to the bulk-head I, so that at any one moment only one-half the whole number of floats E are within the flume and being acted upon by the current. As the wheel revolves, the buckets E which are outside the flume are raised up to pass over the bulk-head I by the track-rod K, and to relieve friction upon said track a friction-roller, *e*, is placed under the free edge of each of said floats.

The radial arms A are supported by truss-rods *d*, and their ends are tied together by the tie-rod *g*.

When it is desired to stop the wheel the buckets or floats may be raised up to a horizontal position. This is the only method when, during freshets, the wheel may be wholly submerged and the gates J unable to shut out the water. At such times the wheel will operate as well as at other times, but cannot be controlled by the gates as at ordinary stage of water. To put the wheel under control by raising the floats and holding them in a horizontal position, I put upon each float one or more straps, L, which are rigidly secured at one end and are free at the other, and curved, as shown, so as to be permanently raised up from the surface of the float at the free end. Upon the arms A′, which are intermediate between the arms to which the floats are hinged, I place a number of hooked latch-bolts, M, corresponding to the number of straps L. These hooked bolts are capable of being moved laterally so as to bring their hooked end under and in engagement with the straps L, so that the floats will be thereby supported. The hook-bolts M are also capable of swinging sidewise, so that, having been moved into engaging position over the said straps L, they will be pushed and caused to swing sidewise as the float rises in passing over the bulk-head I, and will drop over the ends of and fall beneath said straps, so as to hold the float up as it moves over the flume.

To effect this movement of the hooked latch-bolts M, I connect each with a sliding collar, N, upon the shaft B by means of rods *m*. The collar N has a cross-bolt, which passes through slots *p* in opposite sides of the shaft B, and is connected at the center with a rod, Q, which passes upward through the upper end of said shaft, and is connected with a lever, R, or other efficient means of controlling it. By raising

or lowering the collar N the several latches M are moved in one direction or the other, as desired, to engage or liberate the floats.

The bulk-head I extends past the shaft B, and then curves around, so as to partly inclose the same and closely approach the inner ends of the floats as they move. The outer end of the bulk-head I thus forms a passage-way between itself and the corresponding end of the bulk-head H, to divert all the water passing upon the floats, and, at low stages, to correspondingly reduce waste of water.

Having described my invention, what I claim as new is—

1. The sliding catch-bolts M, operated by a sliding collar, N, on the wheel-shaft B, and suitable connecting-rods *m*, whereby each bucket may be caught by catch or loop on the front of bucket E, and held up automatically, and the wheel caused to stop without shutting off the water.

2. A hollow wheel-shaft, B, combined with a sliding collar, N, connecting with each catch-bolt M, and operated by rod Q, connected with said collar N at lower end, and extending thence upward through the interior of said shaft to a suitable lever, whereby said collar and the catch-bolts M, to which it is connected, may be operated through the center of the wheel-shaft B.

3. Combined with the bulk-head H and a current water-wheel, substantially as described, a bulk-head, I, extended past the main shaft B, substantially as set forth, to confine and direct the water upon the skirt of the wheel and prevent waste of water.

WALLACE W. CLEAVELAND.

Witnesses:
DAVID N. GREEN,
JAMES R. DICKEY.