

Patented Dec. 29, 1868.

A circular geological cross-section diagram. The left half of the circle is filled with numerous concentric, slightly wavy lines, representing a layered structure. This area is labeled with a large 'C' in the center and a small 'r' near the outer edge. The right half of the circle is divided into several distinct, wedge-shaped regions by lines radiating from the center. These regions are labeled with various letters: 'B' in the central wedge, 'C' and 'Cc' in the upper and lower wedges, 'W' and 'Wc' in the middle wedges, and 'R' and 'Rr' in the outermost wedges. The labels suggest different geological strata or rock types.

A diagram of a curved wall section. It features a series of vertical lines representing structural elements. Labels m , m' , m'' , and m''' are placed near the wall. The top and bottom edges are curved, with a label r at the top center and r' at the bottom center.

Inventor:
D. L. Bartlett by
J. W. Beadle atty

United States Patent Office.

DAVID L. BARTLETT, OF ROCKFORD, ILLINOIS.

Letters Patent No. 85,421, dated December 29, 1868.

IMPROVEMENT IN WATER-WHEELS.

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

To all whom it may concern:

Be it known that I, DAVID L. BARTLETT, of Rockford, in the county of Winnebago, and State of Illinois, have invented new and useful Improvements in Water-Wheels; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and the letters of reference marked thereon.

Figure 1 is a perspective view;

Figure 2, a top view, showing a portion of the case broken away to reveal the internal construction;

Figure 3, a perspective view of a portion of the curb; and

Figure 4 represents details of construction of the chutes and gate.

This invention relates to that class of turbine wheels which has a side "feed," opened and closed by a "ring-gate," by means of a segment and a pinion upon a hand-spindle.

The improvement which I am about to describe consists in a new and more simple, substantial, and durable construction of the curb and gates.

In the drawings—

A indicates the shaft,

B, the wheel, and

C, the top plate of the curb, the latter being connected to the bottom plate, C', by means of upright partitions, forming between them the chutes W W, for the passage of the water to the wheel.

For the purpose of increasing their strength, and at the same time directing the water in a more compact body upon the wheel, the partitions are not made in the form of a single straight plate, but are made, as represented in detail in fig. 4, with one long straight wall, a , and one short one, a' , forming the side walls of the chutes, one short concave wall, a^2 , fitting against the perimeter of the wheel, and one long convex wall, a^3 , in contact with which the gates slide back and forth.

The four walls, a a' a^2 a^3 , thus constitute an irregular quadrilateral, from the corner of which projects outward the end of wall a , forming a flange, which I will designate as a^4 . The flanges a^4 reach beyond the outer edge of the upper and lower plates of the curb, thus supporting those two horizontal plates, and connecting them together in the most rigid and substantial manner.

I am aware that a curb of the general construction herein described has for a long time been in public use, but I am not aware that in such a curb, having the walls a a' a^2 a^3 , or their equivalent, intervening between the chutes, the extension a^4 , of the wall a , running beyond the outer edge of the top and bottom plates of the curb, and supporting them both clear out to that edge, on every side of the wheel, has ever heretofore been employed.

In connection with the wheel and curb above described, I employ a ring-gate, R, consisting of one an-

nular piece, r , at the upper edge, fitting closely around the outer edge of plate C, and a similar piece, r' , at its lower edge, fitting in the same manner around the edge of the lower plate, C', of the curb, and under the plates a^4 .

These two rings are connected firmly together by the upright curved plates m m' , each of which constitutes a sliding door, that opens or closes the mouth of the chute in connection with which it operates.

The ring-gate thus formed is partially rotated, in one direction or the other, for the purpose of opening or closing the chutes, by means of rack-segments s s , pinions p p , and a vertical spindle, \bar{p} , provided with a hand-wheel at its upper end.

I am well aware that a ring-gate operated by a spindle is not new, as applied to water-wheels, and I do not broadly claim such a device as my invention.

If my wheel be carefully examined, it will be noticed that the upright plates m m' , which open and close the chutes, are constructed of two parts, one, m , lying close against the convex wall, a^3 , the other, m' , extending outward from the end of the part m , at an angle of about forty-five degrees, more or less, and, when the gates are opened, fitting closely against the rear side of the wall a^4 , as seen in figs. 2 and 4. This part m' thus extends obliquely across the whole width of the gate-rings r r' , strengthening the gate and distributing the weight of the parts equally and uniformly, while in the old form of gate, in which the part m' is wanting, the two rings r r' being connected only with the part m , and that at their inner edge, the device was weak, and liable to warp and break, especially should any heavy object come in contact with the outer edge of either ring, r or r' .

In addition to these advantages of construction, which relate chiefly to the strength and durability of the curb and gate, my improved device, as above described, has this advantage, which is an essential object of its construction, namely, that the parts a^4 and m' , whether separately or conjointly, form a considerable extension to the length of the chute, gathering the currents and directing them into the chutes; and thereby greatly facilitating the flow of water to the wheel.

The additional strength imparted to the gate by the oblique supports m' m' , enables me to make the rings r r' wider without increasing their thickness, and thus to elongate the chutes and enlarge their mouth, to as great a degree as possible or practicable, without loading down the apparatus with a great weight of useless metal. Inasmuch, however, as the parts m' m' are added to the gate, and the rings r r' are made somewhat wider than heretofore, its weight will be more or less increased; and to sustain it, and enable it to work with perfect ease under the great head of water in which it is employed, I support the whole gate upon trucks or rollers, v v , fastened by stud-bearings or journals to angle-iron plates, e e , which rest upon the bed-pieces or floor F.

I do not broadly claim, as my invention, the use of friction-rollers to support the gate of a water-wheel, for I am aware that such rollers have been employed in connection with the upper ring of the gate, being constructed and arranged to rest upon and traverse around the top plate C of the curb. Such a construction, however, has many and obvious disadvantages, and I consider my arrangement of the rollers beneath the lower ring, and immediately in contact with it, the rollers themselves being supported by plates *e e*, entirely independent of the rings, and individually adjustable, both laterally and vertically, without moving the rings, as superior to every device of the kind, in point of simplicity, durability, cheapness, and perfection of operation.

Having thus described the several features of my invention,

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

In combination with a curb, in which the wall *a*, of the chutes, is prolonged beyond the wall *a*³, so as to form the projection *a*⁴, a ring-gate, in which the slides that open and close the chutes are constructed with the two parts *m m'*, arranged, when open, to reinforce the parts *a*³ and *a*⁴, all substantially as and for the purpose described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

DAVID L. BARTLETT.

Witnesses:

C. F. MILLER,
H. H. WALDO.