

E. Tuttle,
Water Wheel,

N^o 66,189,

Patented June 25, 1867.

Fig. 1.

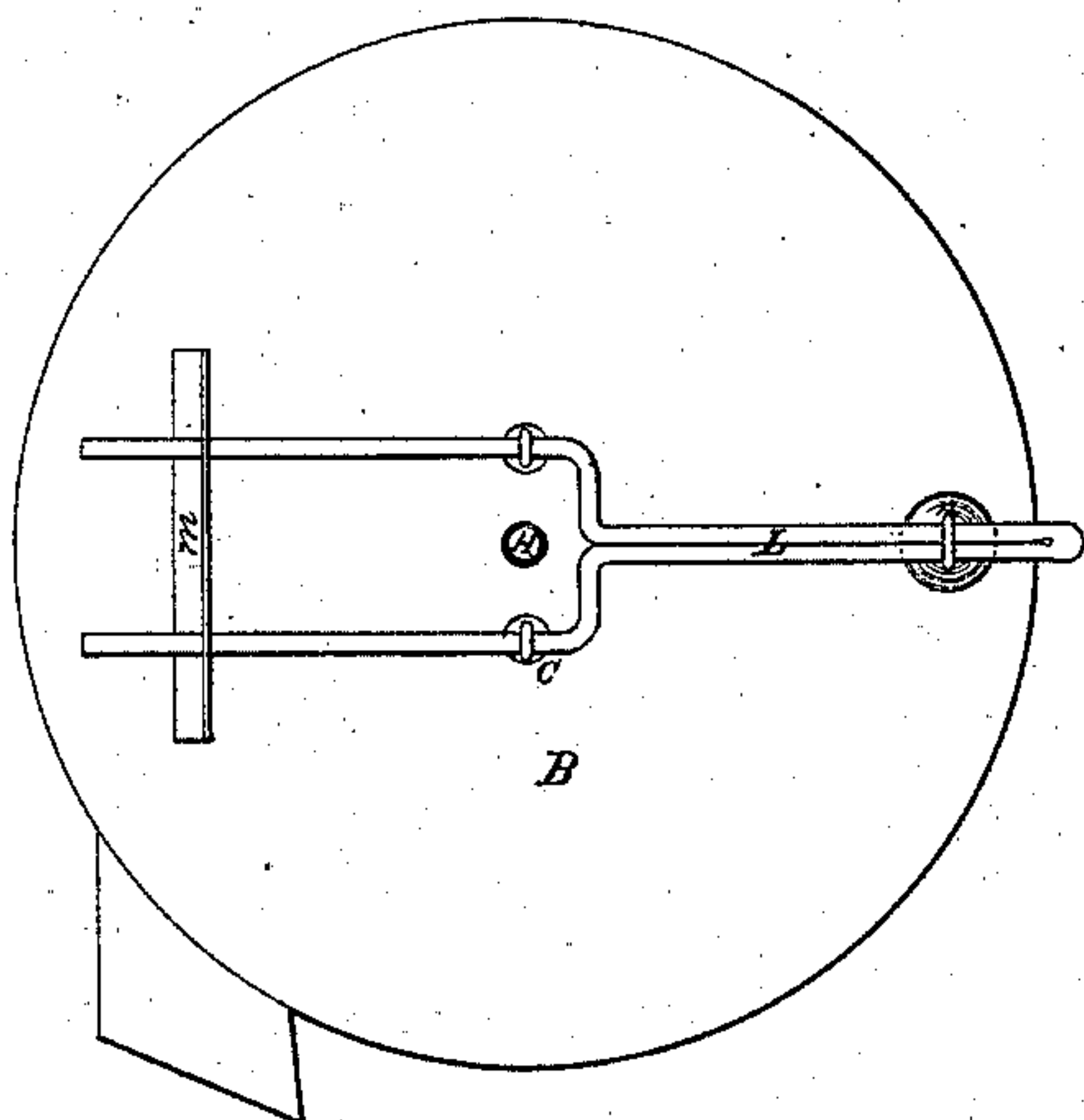


Fig. 3.

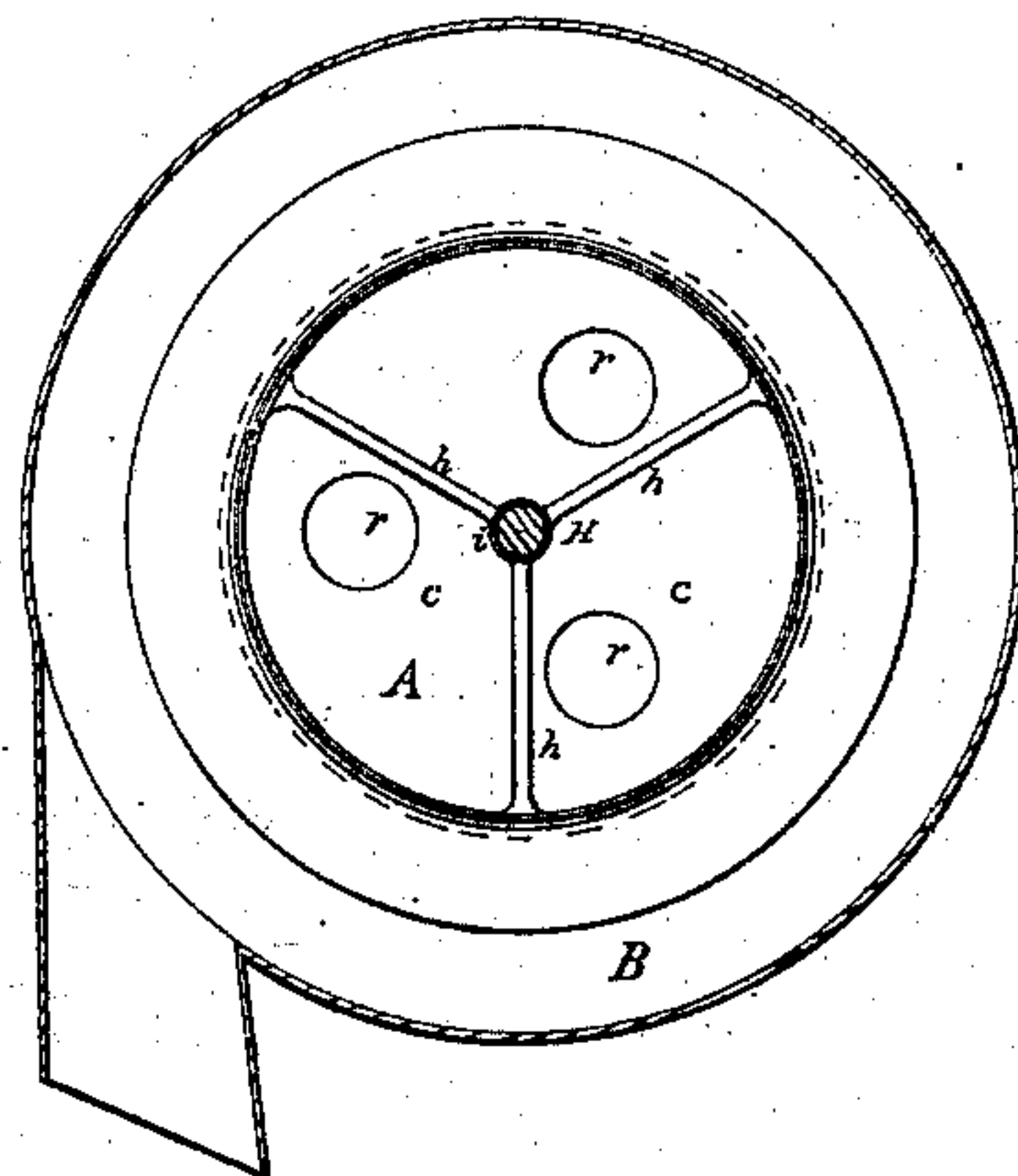


Fig. 2.

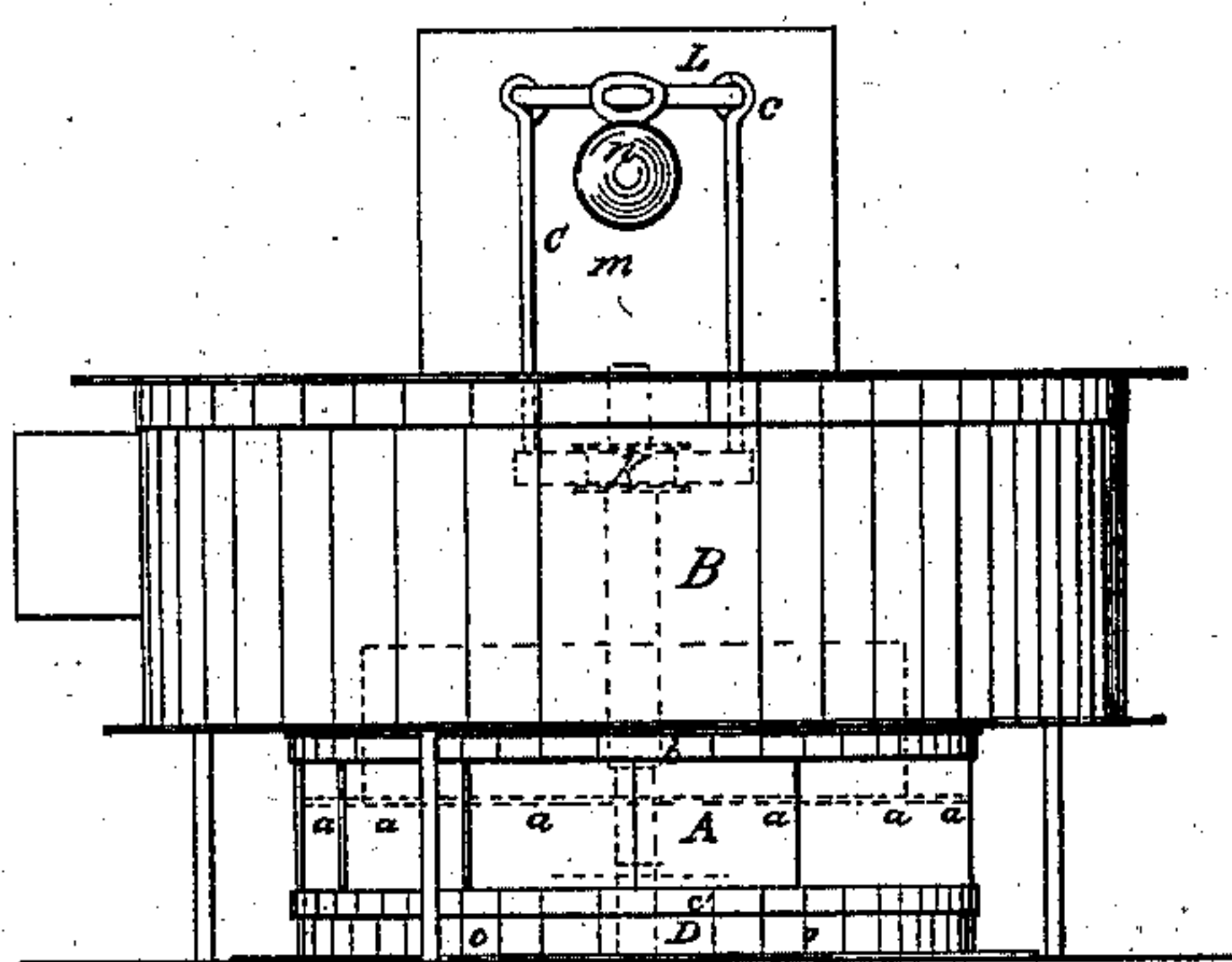


Fig. 4.

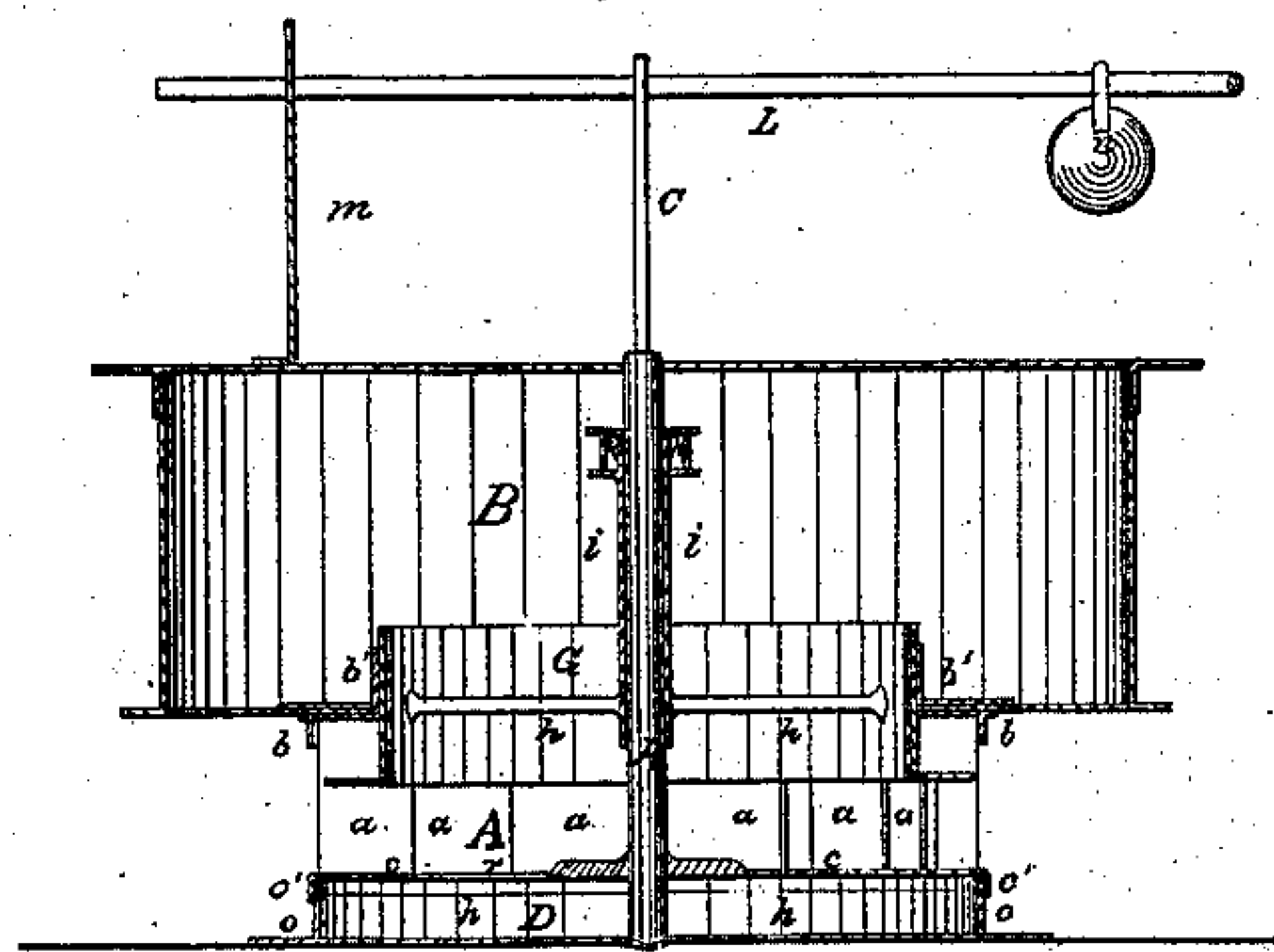


Fig. 5.

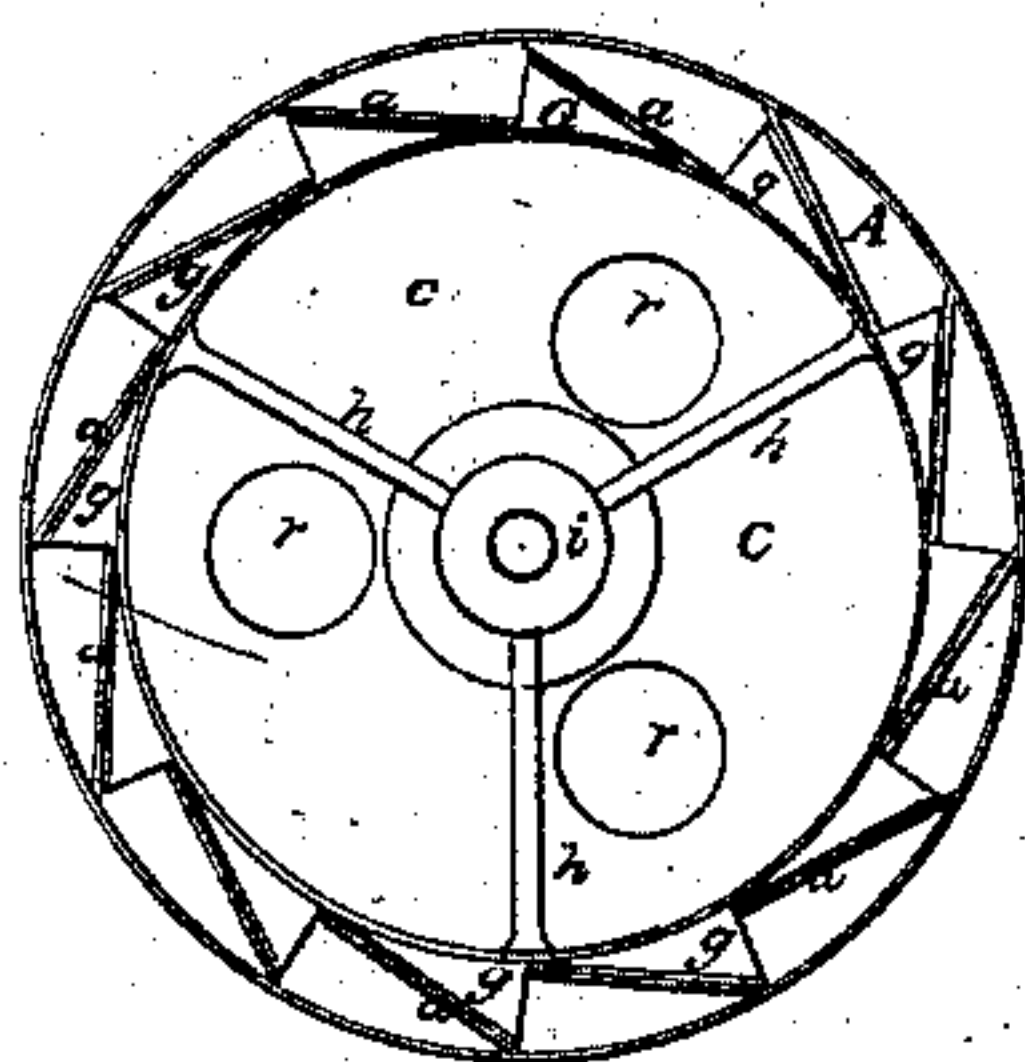


Fig. 6.

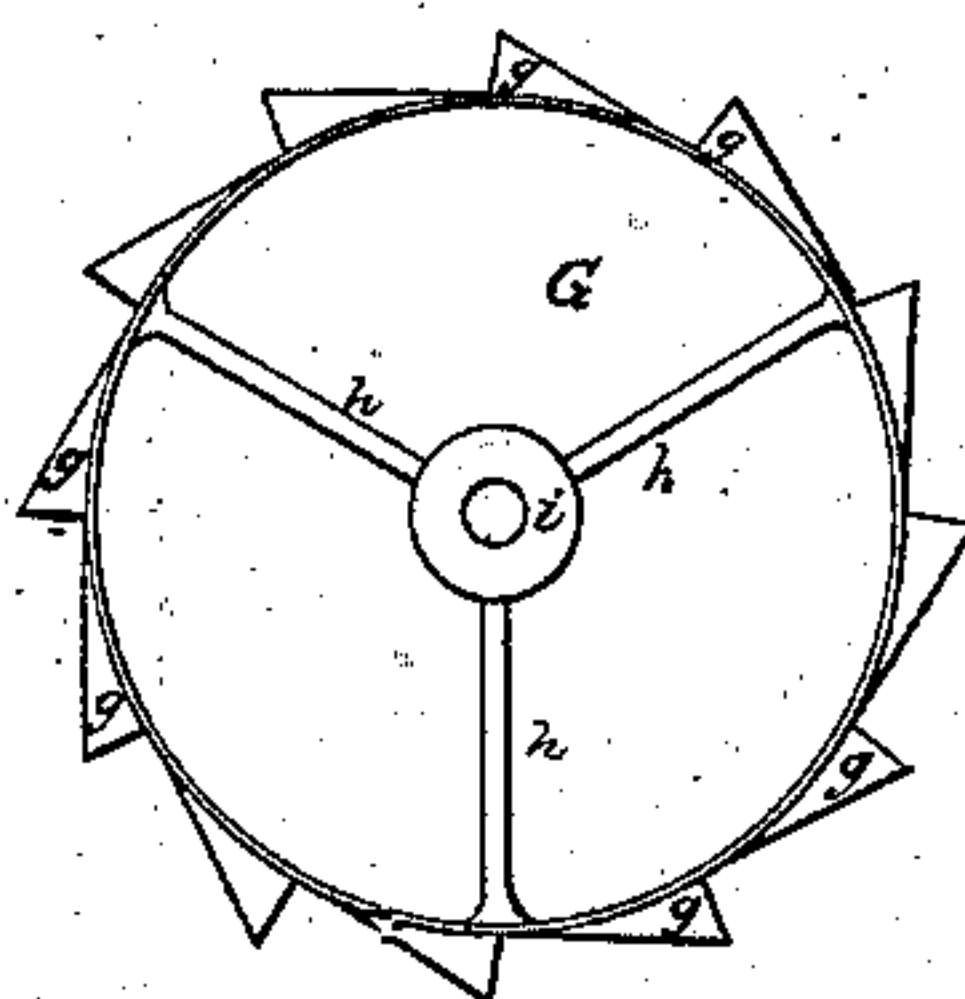
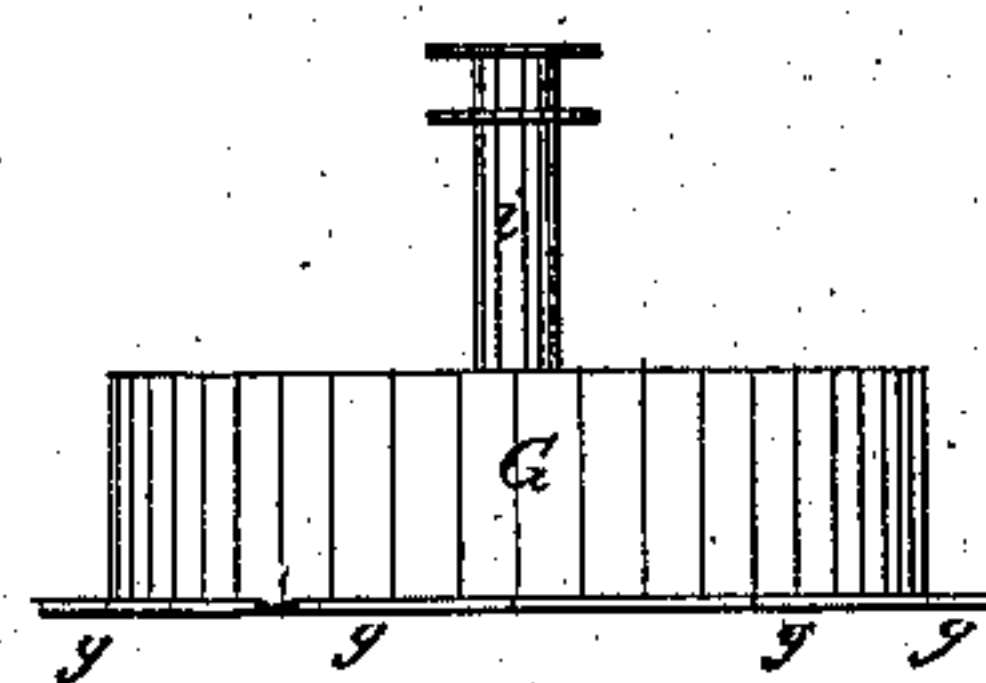


Fig. 7.



Witnesses.
Joseph O. Hamman
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United States Patent Office.

EBENEZER TUTTLE, OF CANAAN, MAINE.

Letters Patent No. 66,189, dated June 25, 1867.

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, EBENEZER TUTTLE, of Canaan, in the county of Somerset, and State of Maine, have invented a new and useful Improvement in Horizontal Water-Wheels; and do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, of which—

Figure 1 is a top view of my invention in connection with the penstock.

Figure 2, a side elevation.

Figure 3, a horizontal section, taken on line *x x* of penstock; and

Figure 4, a vertical section of same, taken on line *y y*.

Figure 5 is a top view of wheel and gate with upper rim of wheel removed.

Figure 6 represents the gate as detached from the wheel; and

Figure 7, an elevation of the gate.

This invention relates to an improvement in outward-discharging horizontal water-wheels wherein the gate (which slides vertically and rotates with the wheel) is constructed with a series of horizontal projections on its lower edge, (figs. 6 and 7,) which enter the spaces between the buckets of the wheel, so that raising or lowering the gate virtually varies the capacity of the buckets, causing the water to act upon the buckets in a solid body, and consequently in the most efficient manner.

My invention consists in placing a circular disk below the seat of the wheel, leaving a space between the wheel and disk for reception of the water, for the purpose of buoying up the wheel, and thereby removing all, or nearly all, the friction from the lower end of the driving-shaft; and also, in a balance or regulator-attachment, by which the capacity of the wheel is suited to the power required, while the speed remains nearly uniform.

Such being the nature of my invention, I will now describe its construction and operation.

In the drawings, A represents an outward-discharging horizontal water-wheel; G, the gate thereof; B, the penstock; C, the regulator, and D the buoying-disk. Of the wheel A, *a a* are the buckets. *b*, the upper rim, with vertical flange *b'*, against which the gate G slides. *c* is the lower rim or disk of the wheel, which is firmly attached to the driving-shaft H, said rim having a lip, *c'*, which encompasses the vertical portion of the buoying-disk for the purpose of preventing leakage. Within this wheel is the gate G, which rotates with the wheel, and has horizontal adjustable plates *g g* attached to its lower edge, said plates *g* entering the spaces between the buckets, and forming an auxiliary rim to the wheel. This gate G is attached to the driving-shaft H by three or more arms *h h*, radiating from a hollow shaft, *i*, which encircles the driving-shaft, by means of which the gate is held in position in relation to the wheel, and during the movements of both. The hollow shaft *i*, at its upper end, is embraced by a loose yoke, K, the arms of which extend upward through the penstock, and receive the legs of a bifurcated lever, L, said legs entering a post, *m*, while the lever at its opposite end receives a weight, *n*, this arrangement (see figs. 1 and 2) being for the purpose of counteracting the buoyancy of the gate, and regulating the same according to the duty required of the wheel. The buoying-disk D has a vertical flange, *o*, which is encircled by the lip *c'*; on the rim of the wheel, and has also the step or crapaudine which receives the lower end of the driving-shaft, while between this disk and the disk *c* of the wheel is a space, *h*, for reception of the water which enters through apertures *r r* in the disk of the wheel, the pressure of the water in this space tending to buoy up the wheel and remove friction from the lower end of the driving-shaft H.

The operation is as follows: The gate being partially raised, the water, rushing through the wheel, buoys up the gate, which revolves with the wheel, while the regulator-attachment C holds the gate at the desired height while the wheel is working, and counteracts the buoyancy of the gate, while the water, at the same time, enters the space *h*, and, by its pressure, buoys up the wheel, thereby removing the friction from the lower end of the driving-shaft.

I am aware that it is not new to apply a circular gate with horizontal plates to an inward-discharging water-wheel, for such is the subject of a patent granted to me February 12, 1861, No. 31,418, experience with this construction of wheel suggesting to me the present improvement, by which I not only remove the weight and pressure of the water from the gate, but use the water to buoy up both gate and wheel, thus producing a more simple and effective water-wheel.

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

The regulator C and disk D, arranged in relation to the gate G and wheel A, substantially as and for the purpose set forth and described.

In witness whereof I have hereunto set my signature.

EBENEZER TUTTLE.

Witnesses:

JOSEPH O. SCAMMAN,

JOSEPH BARRETT.