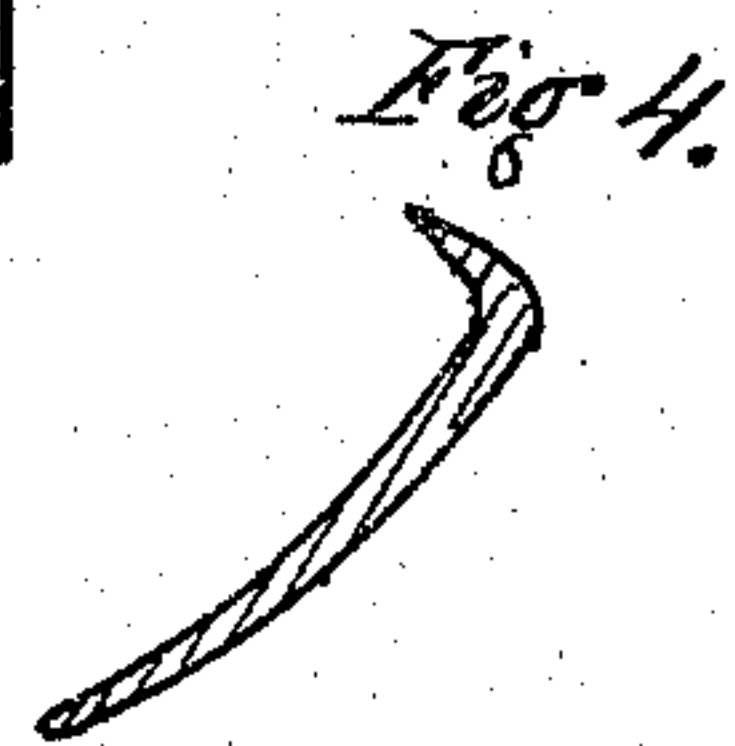
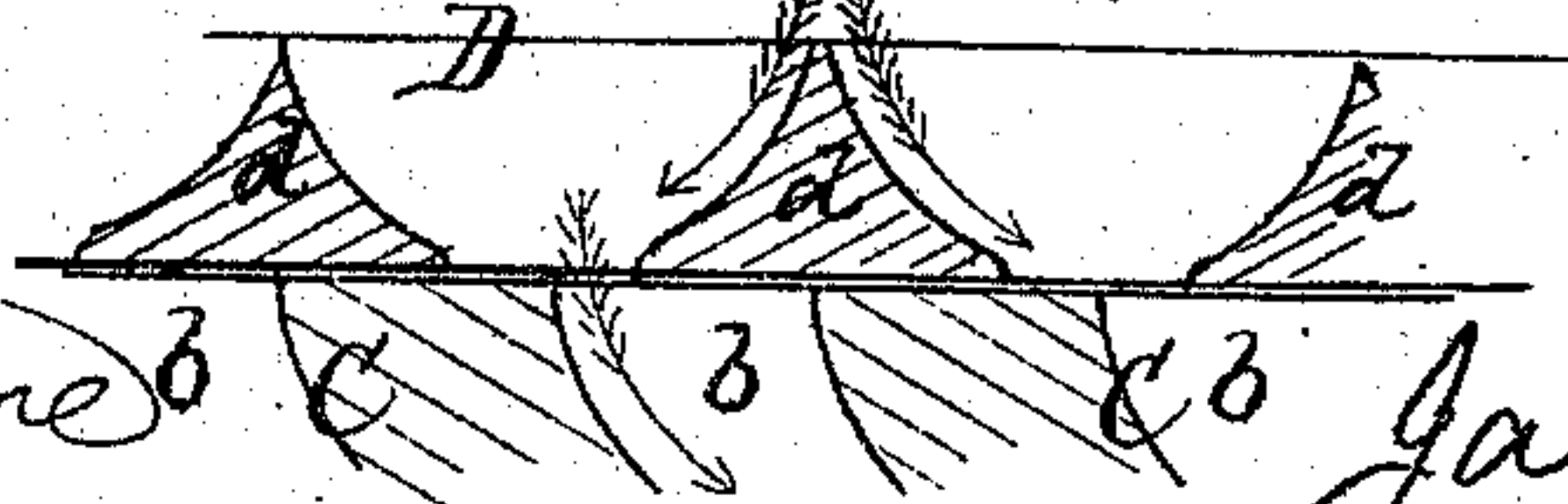
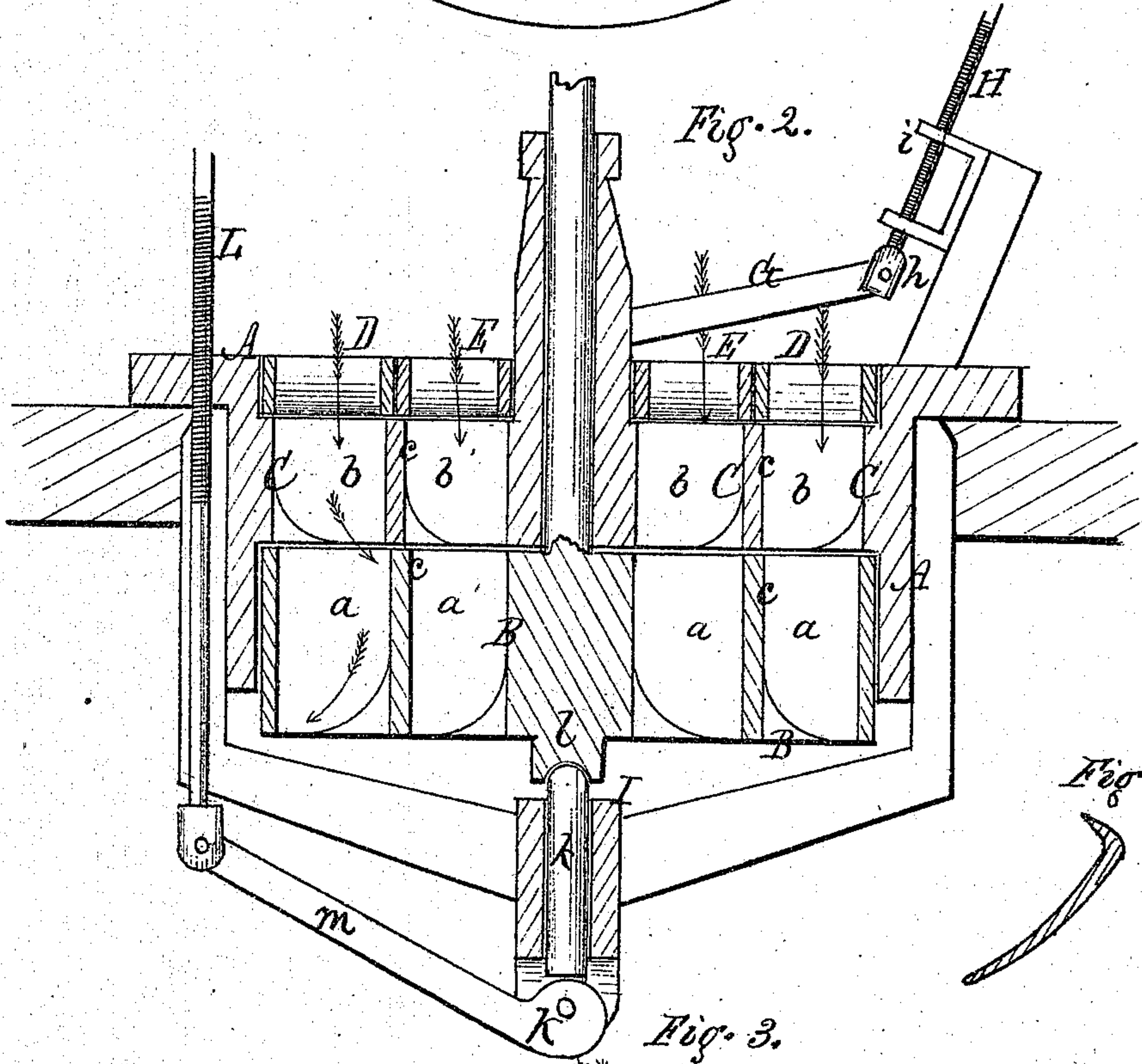
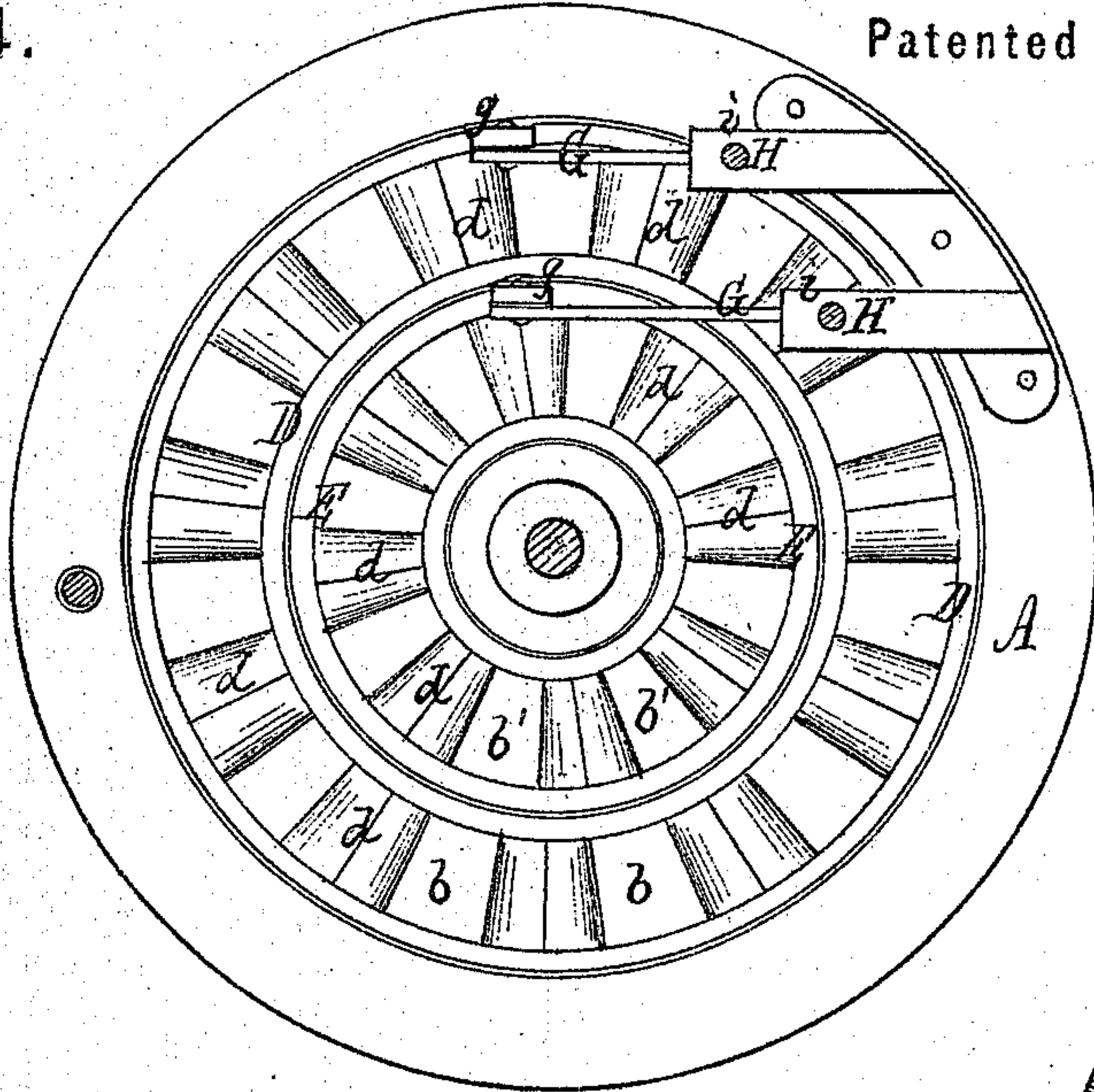


JAMES C. KELLEY.

Improvement in Water Wheels.

No. 119,274.

Patented Sep. 26, 1871.



Witnesses.
Archd. Baine
Wm. J. Moore

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UNITED STATES PATENT OFFICE.

JAMES C. KELLY, OF GROVELAND, NEW YORK.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 119,274, dated September 26, 1871.

To all whom it may concern:

Be it known that I, JAMES C. KELLY, of Groveland, in the county of Livingston and State of New York, have invented a certain new and useful Improvement in Water-Wheels, of which the following is a specification:

This invention is an improvement on that patented to me June 21, 1870; and consists essentially in the construction of the gates and the method of operating them; also, the construction of the curb and division-plate; and furthermore, in the arrangement for adjusting the step, as hereinafter described.

In the drawing, Figure 1 is a plan; Fig. 2, a central vertical section; Fig. 3, a section showing the construction of the gates; Fig. 4, a view of one of the buckets of the wheel.

A represents the curb; B, the water-wheel proper; C, the division-plate; and D E, the gates, which correspond in position with the same parts as described in my aforesaid patent.

The curb and division-plate are formed as one integral part, the latter being located at such a position as to allow the gates to be on top flush with the upper edge of the curb, while the wheel proper rests within the curb below the division-plate, being inclosed compactly, as shown, so as to receive the water in its two compartments of buckets, *a a'*, directly from the corresponding two compartments of buckets or passages, *b b'*, of the division-plate. These compartments of the buckets in the wheel are divided by a central rim, *c*, and the corresponding ones of the division-plate by a similar rim, *c'*, said rims coinciding so as to divide the volume of water that descends from the pen-stock in two bodies, either of which may be applied to the wheel independently of the other, according as the gates D E are opened or closed. This is fully described in my aforesaid patent. The buckets of the wheel and of the division-plate are made spiral and incline in opposite directions, so that the water passing downward through the buckets of the division-plate will impinge with full force upon those of the wheel, and in opposite directions from the escape from the wheel. The chutes *d d* of the gates are made sharp-edged at the top, as shown in Fig. 3, and lie flush with the upper surface of the curb or rim; while their sides are made angular and concave down to the ports between them, which discharge the

water to the buckets of the division-plate. This is shown most clearly in Fig. 3. These chutes divide the current of water in equal parts like a wedge, which pass down through the ports with but very little friction and without breaking into foam and counter-currents, and in a compressed and concentrated state. By this means a most effective application of the water is made to the wheel, as it is unbroken and direct.

In my patent alluded to the chutes stand upright from the gates, and the water, to enter them, receives a roundabout and circular motion, which breaks it into opposing currents. My present plan is far more effective, as the water is not broken, but is simply divided and passed downward in a direct and concentrated form. My present chutes have also the advantage of lying low, so as to get a better pressure of the water upon them, and there is less danger of choking by sticks or other obstructions.

This construction of the chutes of the gates forms one feature of my invention. A lug, *g*, rises from the rim of each gate. To this is jointed a rod, *G*, which connects in a similar manner at the opposite end with a block or bearing, *h*, swiveled to a screw-rod, *H*. This screw-rod passes through a bearing or bearings, *i i*, to within reach of the operator. By turning this rod up or down it will be seen that the gate will be correspondingly turned forward or backward, thus opening or closing the passage of water to the wheel. The advantage of this arrangement is that the gates can be opened or closed exactly to the degree desired, and be held stationary in that position without intermediate parts or further trouble. The step is formed by a sliding bearing, *k*, which rests in a block, *l*, and which supports the socket *l* of the wheel. Under this bearing rests an eccentric cam, *K*, having an arm, *m*, that extends outward, to which is jointed a screw-rod, *L*. This rod also extends up within reach of the operator, and, by turning down, the cam will elevate the step as fast as it wears away.

A special feature of novelty in my invention consists in the formation of the division or chute-plate C as an integral part of the curb itself, forming a web which extends horizontally across it, with a depression at the top which just receives the gates, and a deep cavity at the bottom which receives the water-wheel proper, as shown

in Fig. 2. It is readily cast in this form, and is much more compact than has heretofore been made. The gates and the wheel fit into the cavities of the curb each side of its division-plate or web, so as to be fully embedded.

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

1. As an improvement upon my patent of June 21, 1870, the chutes *d d* of the concentric gates D E, said chutes being sharp-edged at the top to divide the water, and angular and concave on the sides to concentrate it to the discharged parts, as herein described.

2. The construction of the curb A and division-plate C in one integral part, with a cavity at the

top to receive the concentric gates and a deep cavity at the bottom to receive the wheel, as herein described.

3. The curb A with division-plate C, concentric gates D E with angular chutes *d d*, the rods G, screw H, swivel-block *h*, and the lever-cam K, and screw L, all arranged as described, and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES C. KELLY.

Witnesses:

R. F. OSGOOD,
ARCHD. BAINE.

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