

(No Model.)

D. L. TRULLINGER.  
GATE FOR WATER WHEELS.

No. 330,753.

Patented Nov. 17, 1885.

Fig. 2.

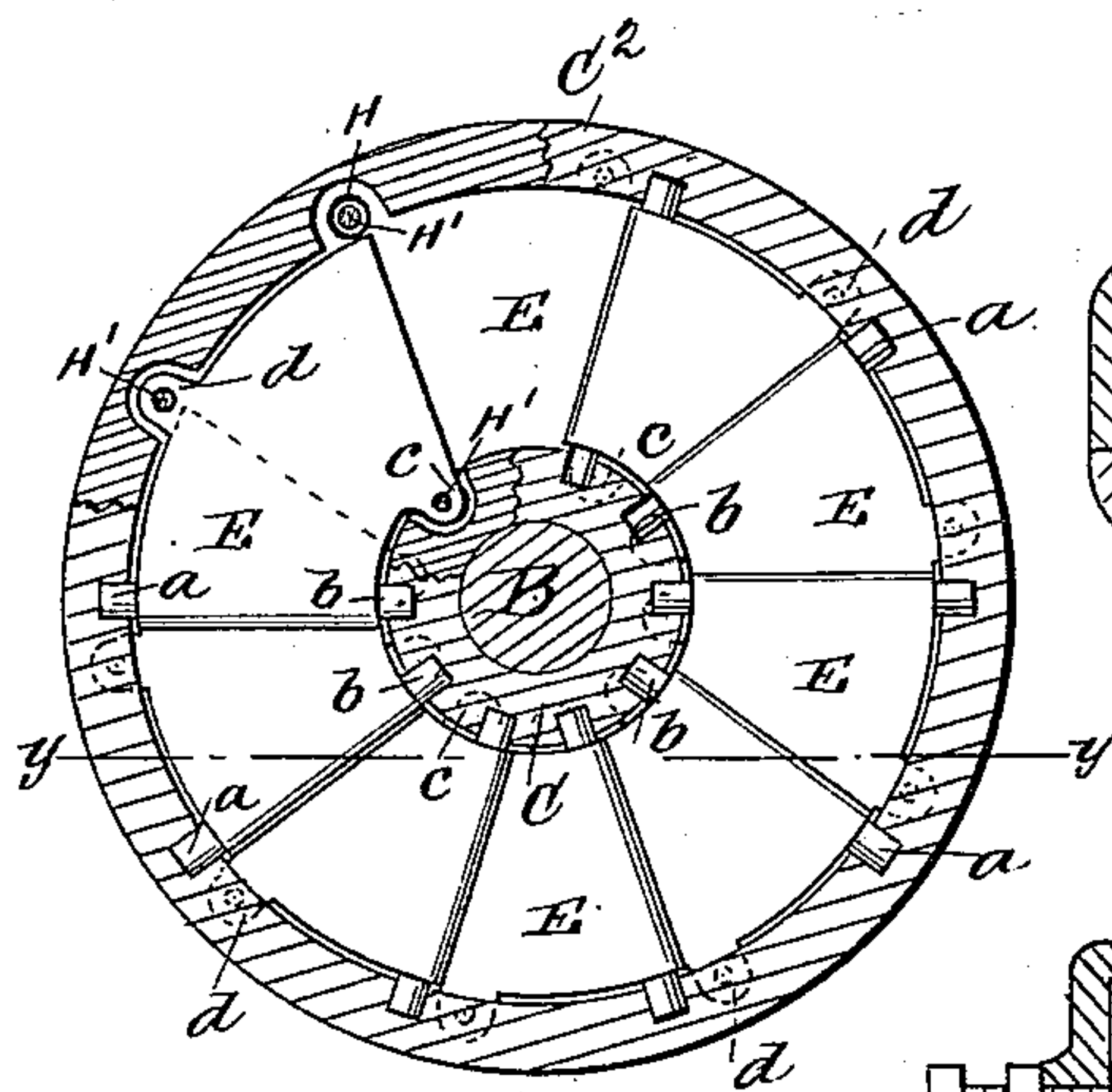


Fig. 3.

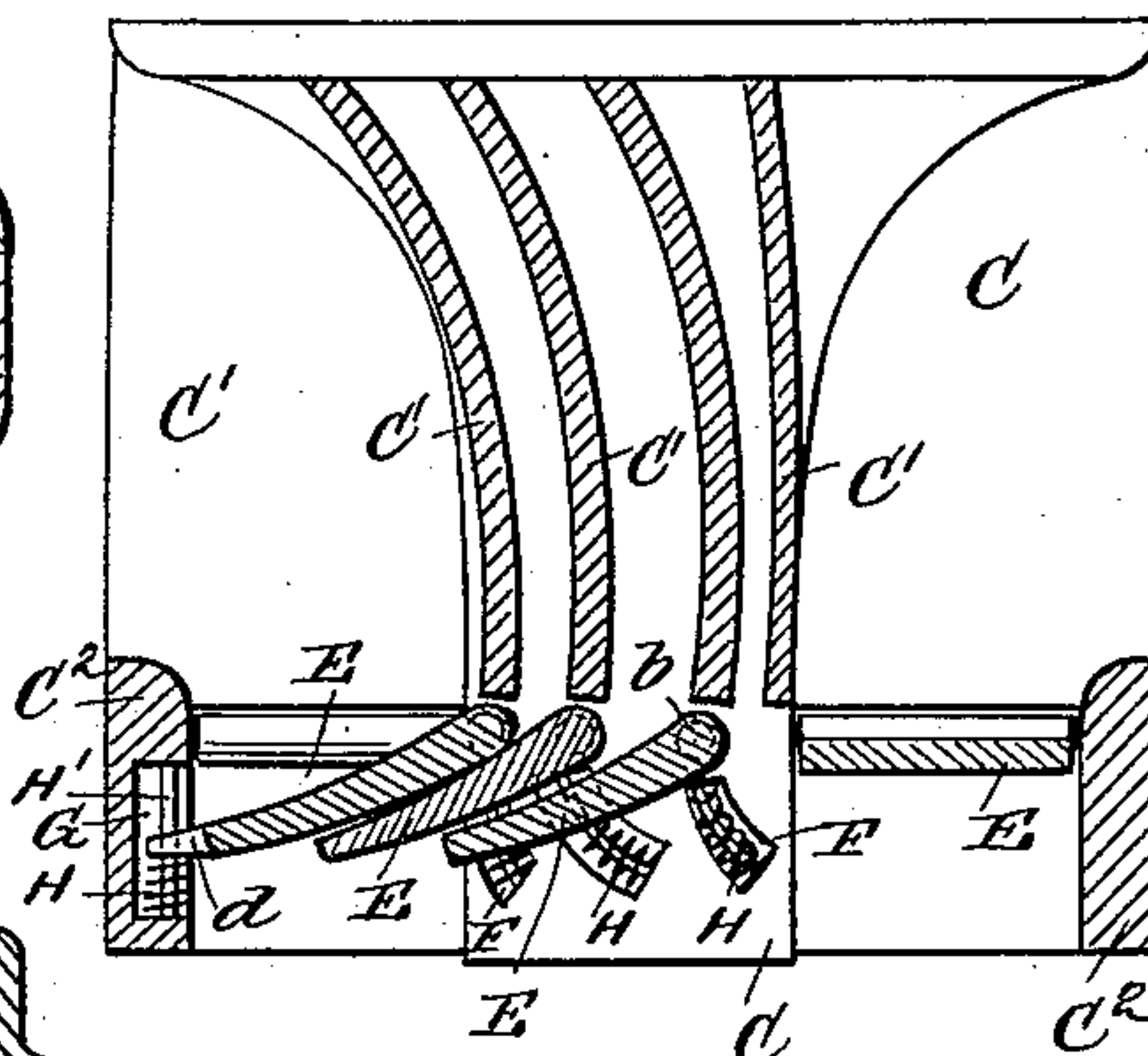
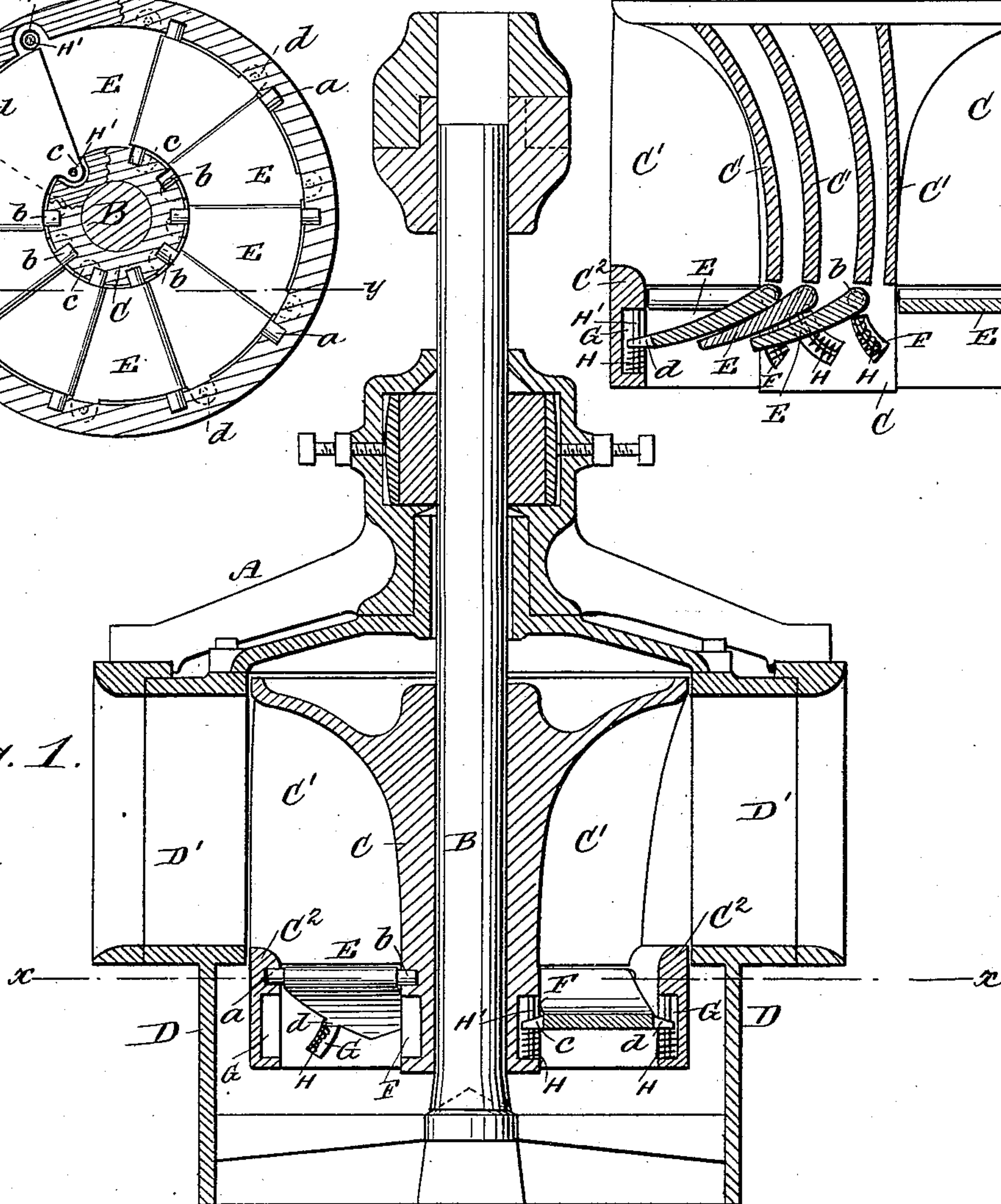


Fig. 1.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

DELAZON LEE TRULLINGER, OF UNION MILLS, OREGON.

## GATE FOR WATER-WHEELS.

SPECIFICATION forming part of Letters Patent No. 330,753, dated November 17, 1885.

Application filed April 28, 1885. Serial No. 163,765. (No model.)

*To all whom it may concern:*

Be it known that I, DELAZON LEE TRULLINGER, of Union Mills, in the county of Clackamas and State of Oregon, have invented certain new and useful Improvements in Gates for Water-Wheels, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved water-wheel in which the discharge-gates are so constructed that they open or expand according to the pressure and the amount of water supplied.

The invention consists of a water-wheel having a series of hinged discharge-gates, each provided with two projecting lugs which play in segmental grooves formed in the rim and hub of the wheel, and of springs placed in the said grooves to regulate the opening or closing of the gates according to the pressure and the amount of water supplied.

My invention also consists of various parts and details, hereinafter more fully set forth and described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section of a water-wheel, showing my improved discharge-gates partly open. Fig. 2 is a sectional plan view on the line  $xx$  of Fig. 1, and Fig. 3 is a vertical section on the line  $yy$  of Fig. 2, showing the discharge-gates closed.

The water-wheel A, of any approved construction, is provided with the wheel-shaft B and the hub C, which carries the buckets C' and the rim C<sup>2</sup>, and which constitutes the running part of the wheel proper, and which is inclosed in the casing D, provided with the usual chutes, D'. Directly under each bucket C' is hung a gate, E, provided with trunnions  $a$  and  $b$ , placed in bearings in the rim C<sup>2</sup> and the hub C, respectively. These gates E are radially arranged under the buckets C', forming bottoms therefor, and each is curved downwardly and overlapped by the next one following, thus partly forming the sides of the buckets. Each gate E is provided on its inner edge with a lug,  $c$ , which

projects into a segmental groove, F, formed on the outside of the hub C, and is also provided with a lug,  $d$ , projecting from its outer edge into a segmental groove, G, formed in the inner face of the rim C<sup>2</sup>. In each of these grooves F and G is placed a coiled spring, H, around a rod, H'. The lugs  $d$  and  $c$  rest on top of the springs H, and slide up or down on the rod H', according to the pressure on the gates E. The grooves F and G are segments of circles of which the trunnions  $a$  and  $b$  are the respective centers, and the coiled spring H and the rod H' are shaped like their respective grooves F and G. The springs H can be covered with slides so as to be protected from trash carried with the water.

The operation of these gates is as follows: The water, having entered the chutes D' and passed the buckets C', reaches the gate E, and the weight and pressure of the water on the top of the gates E swing one end of the same downward, thereby opening the gates to discharge the water. The springs H are consequently compressed by the lugs  $c$  and  $d$  of gate E resting on the same, according to the weight and pressure of the water supplied, whereby the gates E are kept open as long as the pressure is exerted, and close or open still more if the pressure is diminished or increased, thus permitting the pressure of the water to be kept the same inside of the casing whether the gates are fully or only partially open.

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

1. In a water-wheel, the gate E, having the trunnions  $a$  and  $b$ , and provided with lugs  $c$  and  $d$ , and springs H, substantially as shown and described.

2. In a water-wheel, the gate E, hung on trunnions  $a$  and  $b$  in bearings of the rim C<sup>2</sup> and hub C, and provided with lugs  $c$  and  $d$ , in combination with the springs H, and the rod H', placed in the segmental grooves F and G formed in the hub C and the rim C<sup>2</sup> of a water-wheel, substantially as shown and described.

3. In a water-wheel, the gate E, hung on

trunnions *a* and *b* placed in bearings directly under the lower edge of the buckets *C'*, in combination with the spring *H*, substantially as shown and described.

- 5 4. In a water-wheel, the hub *C*, having segmental groove *F*, the rim *C'*, having a segmental groove, *G*, the gate *E*, the spring *H*, and the rod *H'*, substantially as shown and described.

5. In a water-wheel, the hub *C*, provided with the segmental groove *F*, the rim *C'*, having groove *G*, the gate *E*, the spring *H*, and the rod *H'*, substantially as shown and described.

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Witnesses:

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