

W. FORWARD.  
Water-Wheel.

No. 127,471.

Patented June 4, 1872.

Fig. 1.

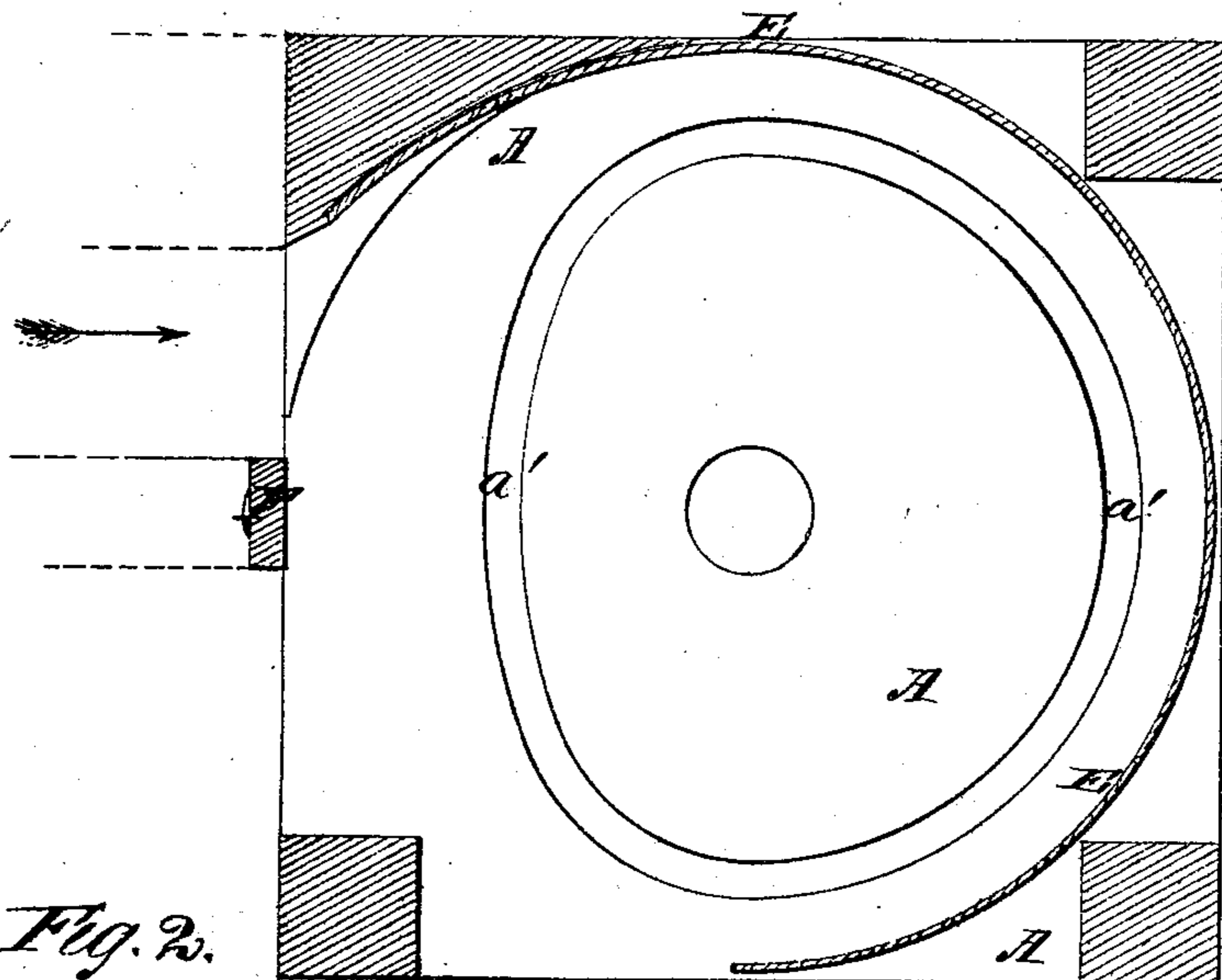


Fig. 2.

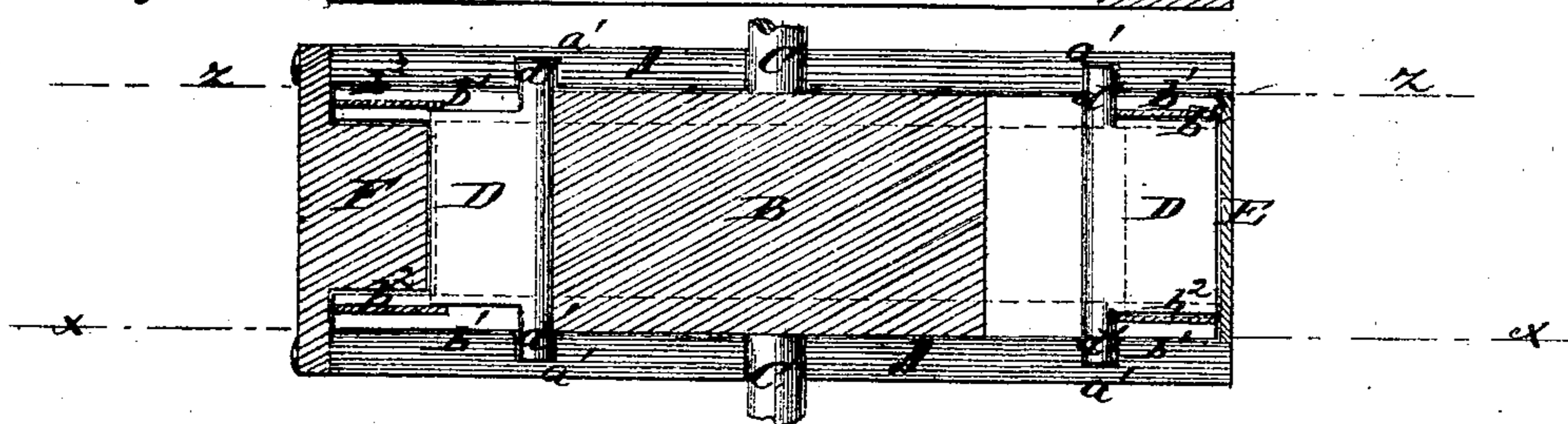
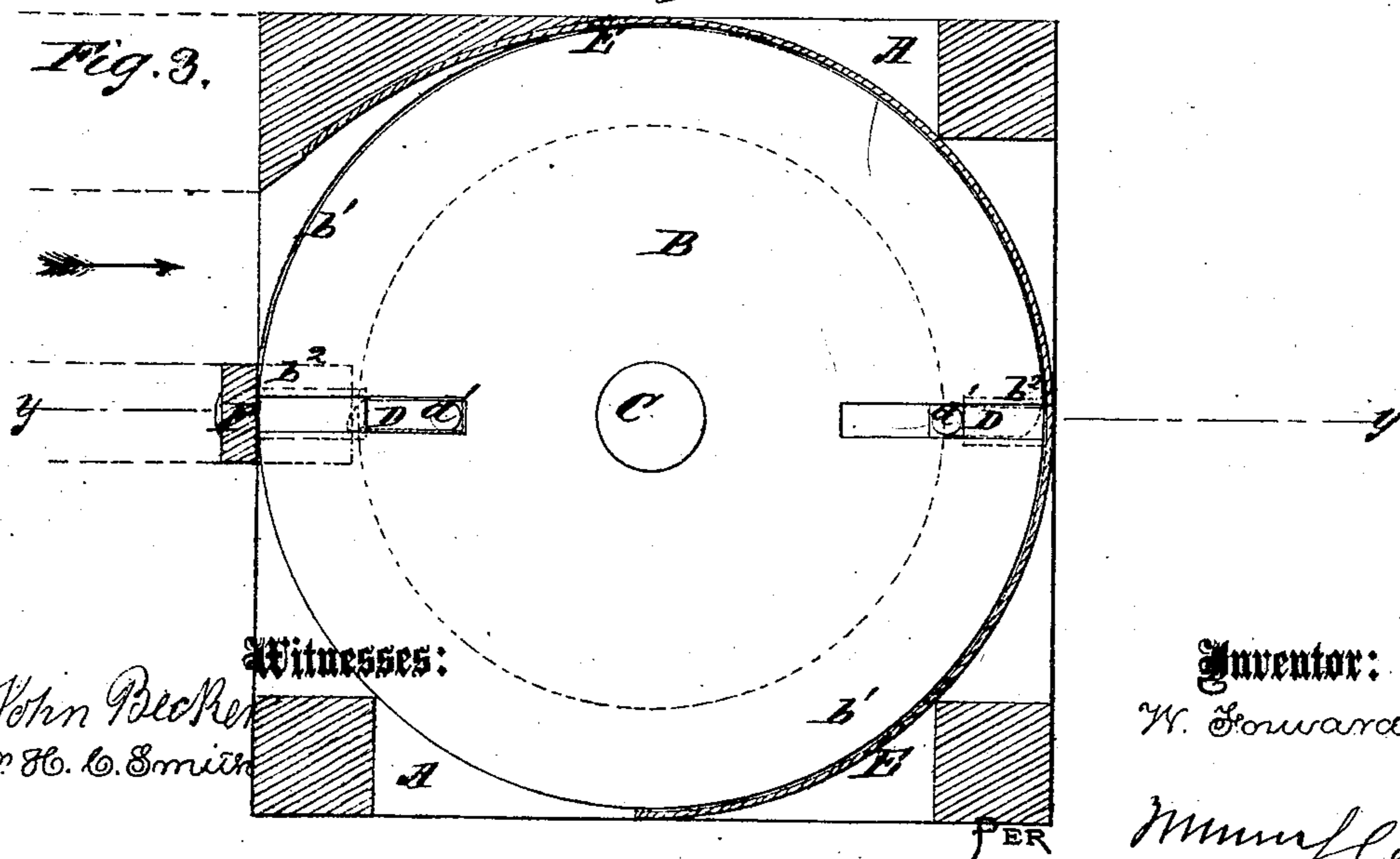


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WALTER FORWARD, OF BATTLE CREEK, CALIFORNIA.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 127,471, dated June 4, 1872.

*To all whom it may concern:*

Be it known that I, WALTER FORWARD, of Battle Creek, in the county of Tehama and State of California, have invented a new and useful Improvement in Water-Wheel; and I do hereby declare that the following is a full, clear and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a detail sectional view of my improved water-wheel taken through the line *x x*, Fig. 2. Fig. 2 is a detail cross-section of the same taken through the line *y y*, Fig. 3. Fig. 3 is a detail sectional view of the same taken through the line *z z*, Fig. 2.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved water-wheel which shall be simple in construction, effective in operation, and economical in use, being so constructed as to utilize almost the entire power of the water; and it consists in the construction and combination of the various parts of the wheel, as hereinafter more fully described.

A are the side plates of the wheel-case, between which the wheel B revolves. The wheel B is attached to the shaft C, which passes out through the side plates A, and is supported and connected with the machinery to be driven in the ordinary manner. The face of the wheel is channeled or has flanges *b<sup>1</sup>* formed upon or attached to its side edges to form a passage-way for the water. D are the buckets, two or more of which may be used, and which are placed in radial slots in the wheel, said slots extending out through the flanges *b<sup>1</sup>* of the wheel so as to fully support the ends of the buckets D. The escape of water through the slots of the flanges *b<sup>1</sup>* around the ends of the buckets D is prevented by the plates *b<sup>2</sup>*, attached to the said flanges *b<sup>1</sup>* in such a way as not to interfere with the movements of the buckets D and not to prevent the ends of said buckets from being fully supported. Upon

the rear ends of the end edges of the buckets D are formed, or to them are attached, projections or pins *d'*, which project at the sides of the wheel B and enter grooves *a'* in the inner surfaces of the side plates A. The grooves *a'* upon the forward side of the wheel, where the buckets are exposed to the full action of the water, are curved upon the arc of a circle. The grooves *a'* upon the rear side of the wheel, where the water is received, are curved upon the arc of an ellipse, the entire grooves forming a continuous curve, so that the projections or pins *d'* of the buckets D may move smoothly and easily through them. By this construction of the grooves *a'*, as the buckets D leave the discharge-opening they are drawn inward, so as to pass the projecting bottom F of the water-box, when they are again projected to receive and be acted upon by the water. The water is confined in the channel of the wheel B, from its entrance to its discharge points, by the curved plate or casing E, so that the buckets D may be under the full pressure of the water from its entrance to its discharge.

F represents the forward edge of the water-box bottom, which is so formed as to fit into the channeled face of the wheel B, the said wheel being so arranged in connection with said bottom F as to receive the water upon the rear side of the wheel, above its center, as shown in Figs. 1 and 3, so that the wheel may always be operated under the full pressure of the head of water, thus making its first revolution with full power.

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

A water-wheel, B, having side plates A A and movable buckets D D, combined with a case, E, surrounding only the top and one side of the wheel, and a water-box having its bottom F projecting nearly into contact with the wheel, as and for the purpose described.

WALTER FORWARD.

Witnesses:

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