

E. F. Crocker.

Turbine Water Wheel.

N^o 100,732.

Patented Mar. 15, 1870.

Fig. 1.

Fig. 2.

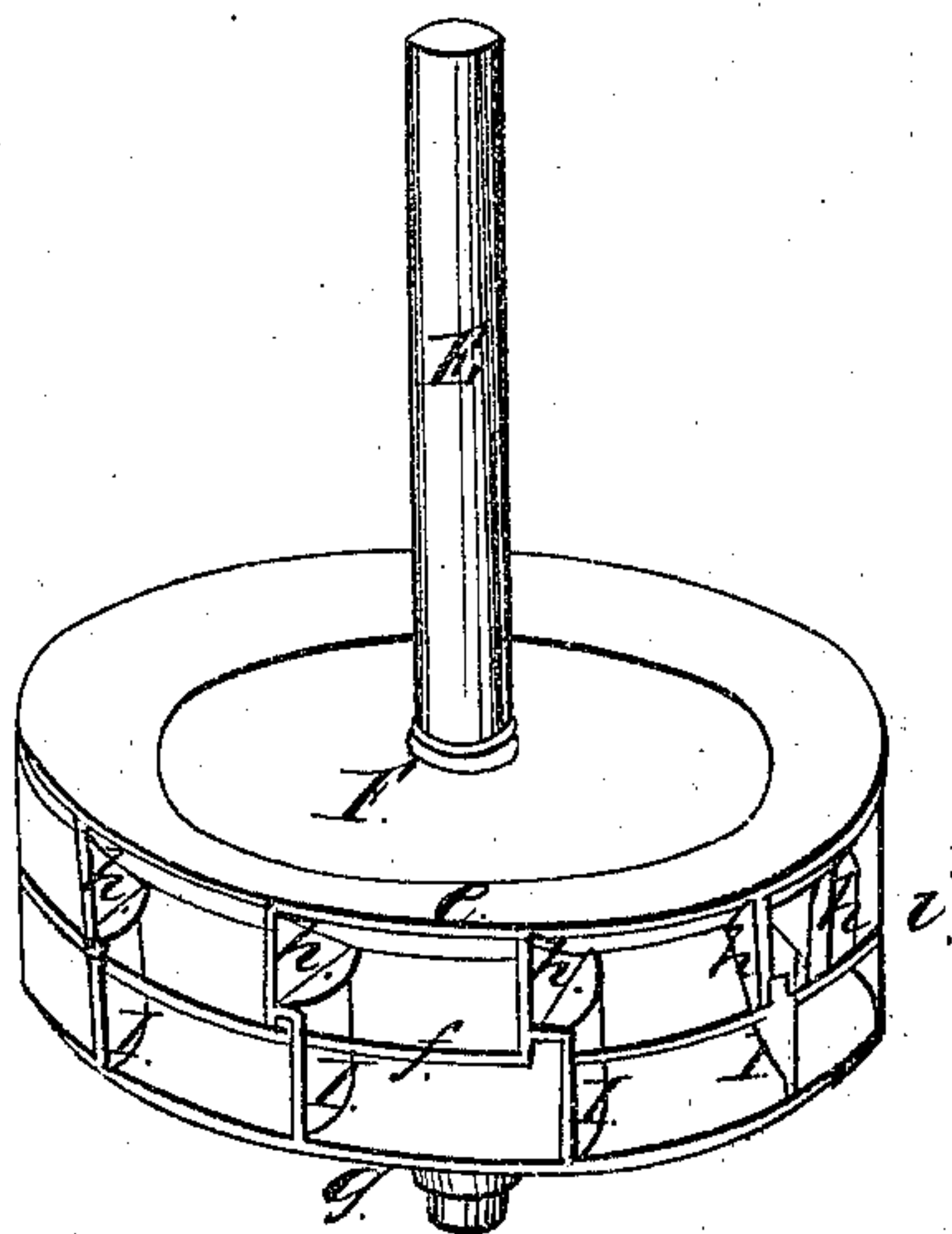
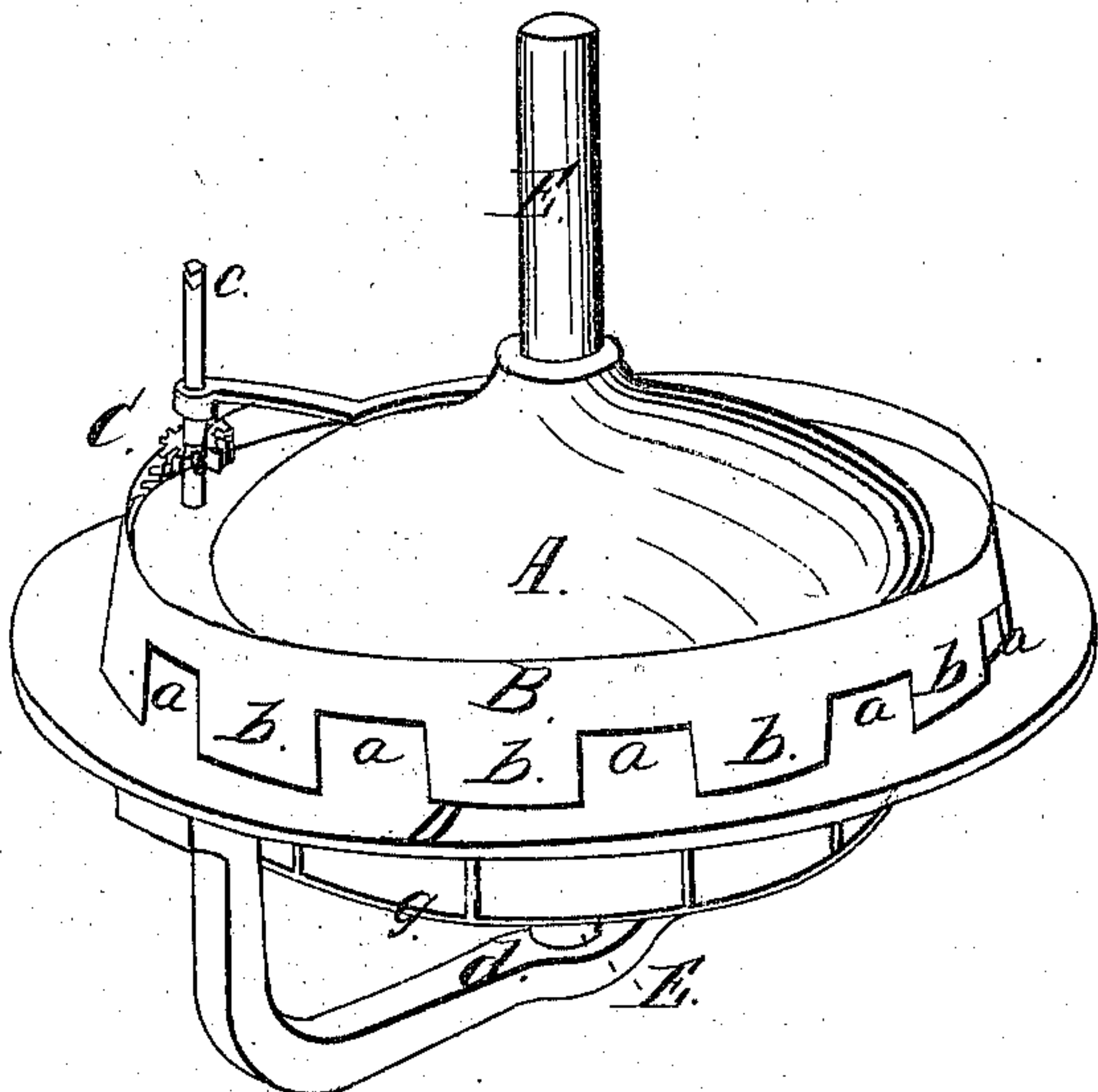
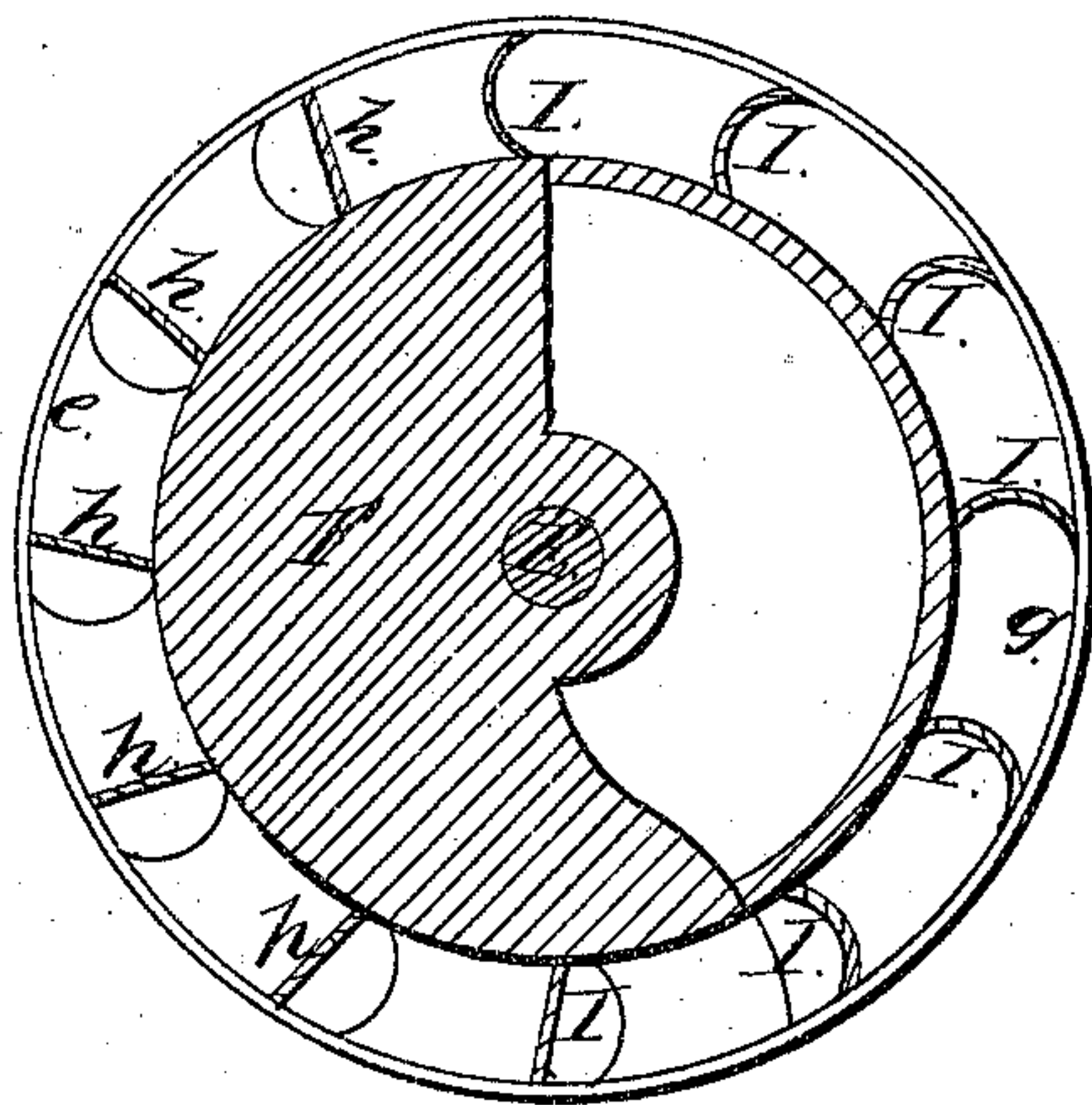
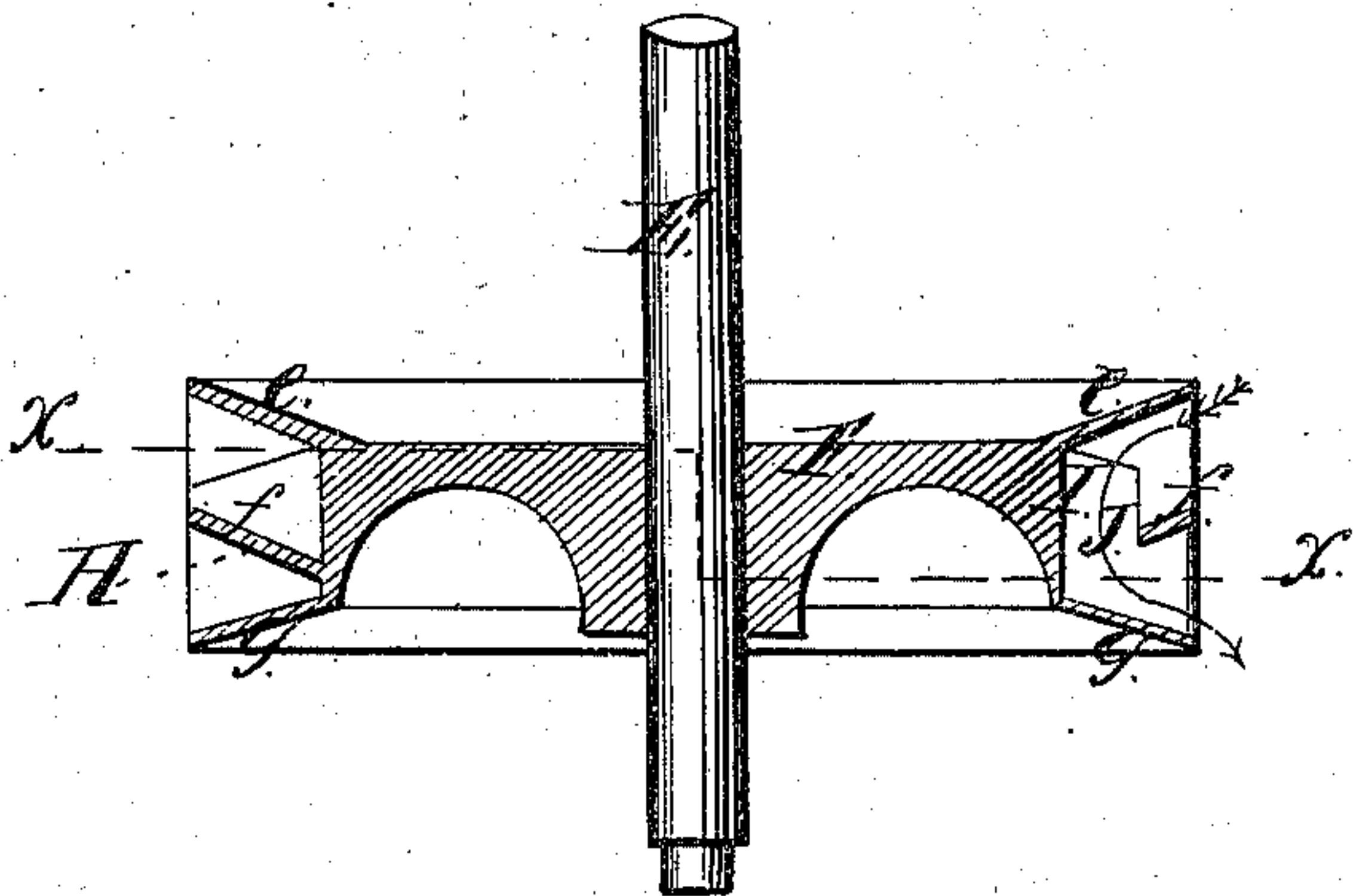
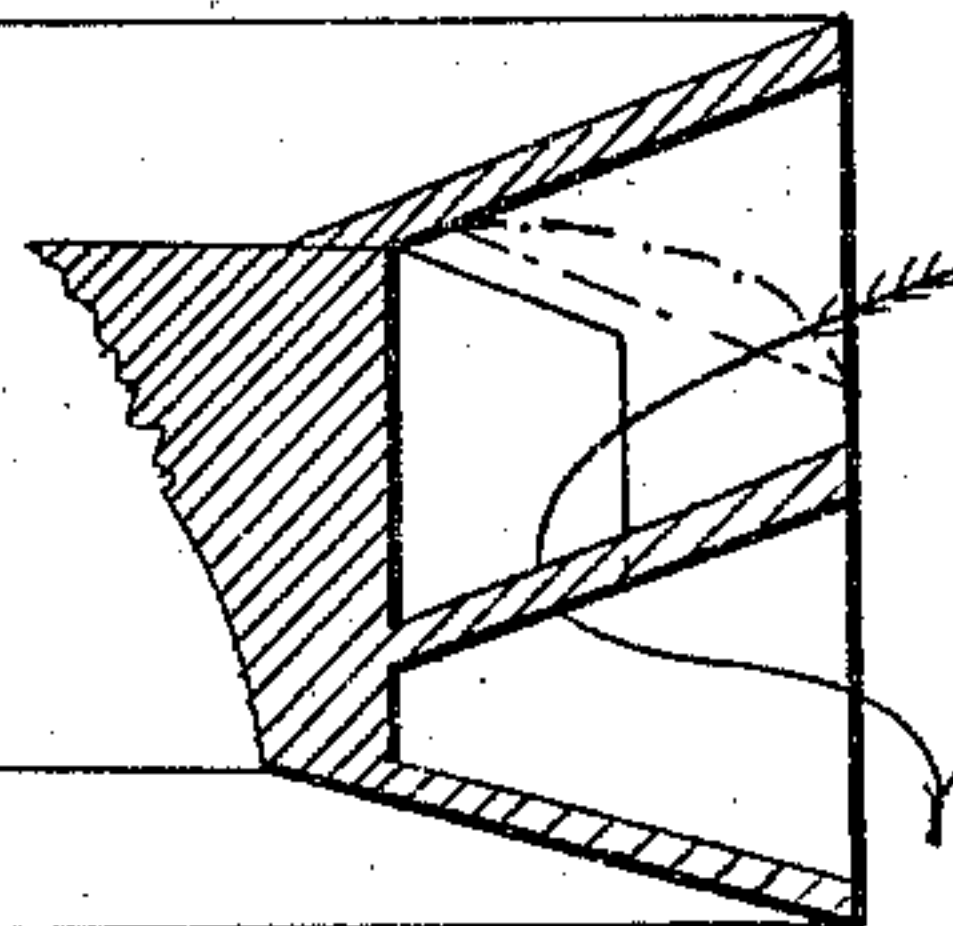


Fig. 3.

Fig. 4.



Witnesses:
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ELEAZER F. CROCKER, OF NILES, MICHIGAN.

Letters Patent No. 100,732, dated March 15, 1870; antedated March 2, 1870.

IMPROVEMENT IN TURBINE WATER-WHEELS.

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

To whom it may concern:

Be it known that I, ELEAZER F. CROCKER, of Niles, in the county of Berrien, and State of Michigan, have invented a new and useful Improvement in Turbine Water-Wheels; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon and being a part of this specification.

Figure 1 is a perspective view of my invention ready to be set into a flume for operation.

Figure 2 is a perspective view of the interior with case removed.

Figure 3 is a vertical section.

Figure 4 is a horizontal section on the line $x x$ in fig. 3.

Like letters refer to like parts in each figure.

The nature of this invention relates to an improved construction of turbine water-wheels, and consists in a new and peculiar form of bucket, in connection with a suitable shaft, case, and step, by means of which a direct action of the water is had upon the upper series of buckets or wings, which action is continued in the discharge of the water through proper openings in a curved cover between the upper and lower set of buckets, the direct action of the water being continued until it is centrifugally discharged from the lower set of buckets, below the flume in which the wheel is set.

A in the drawings represents a proper case having suitable openings, a , in its periphery for the admission of the water to the upper series of buckets; this case is further provided with a rim, B, possessing similar openings, with solid surfaces b between said openings, and is connected by means of a segmental rack and pinion, C, with a shaft, c , or any other convenient device, so that the solid surfaces b may be brought by a partial rotation of the rim B over the openings a , to cut off any portion or the whole of the flow of water into the buckets; the case is also provided with a flange, D, which is designed to set in a proper opening in the bottom of a flume.

To the under side of this flange is secured the step d , in which the lower end of the shaft or spindle E rotates.

To the shaft E is rigidly secured the hub F, which is provided with three flanges, $e f g$, the flanges e and f having a downward inclination from their periphery toward the hub, to which they are attached, while the flange g has an upward inclination, leaving the space between e and f equal, those flanges extending around the hub on parallel lines, while the space between f and g is V-shaped, as shown at H, fig. 3, the flanges f and g extending around the hub on converging lines.

Secured vertically between the flanges $e f$ are a series of buckets, h , not radially, but at a tangent to the shaft or spindle.

The inner and lower corners of these buckets h are cut out, as shown in the detached figure, which is a representation of the buckets, in perspective, and showing their relation to each other.

The water entering at the gates or openings a acts directly upon the left-hand face of the buckets h , thence passing through the opening i in the buckets, referred to above, and through corresponding openings j in the flange f , continues its direct action upon the concave buckets I, which are secured at bottom to the flange g , until it is discharged centrifugally, as shown by the arrow in fig. 3. The peculiar shape of the buckets, and the arrangement of the flanges $e f g$, compel a direct action of the water from its entering to its leaving the wheel. It will be noticed that the outer edge of the flange f rotates upon the same plane of the bottom of the openings a .

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

The turbine water-wheel, with the parts E, F, I, e , $f g$, and h , arranged relatively to each other, and to the parts A, a , B, b , C, c , D, and d , all substantially as and for the purposes herein set forth.

ELEAZER F. CROCKER.

Witnesses:

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