

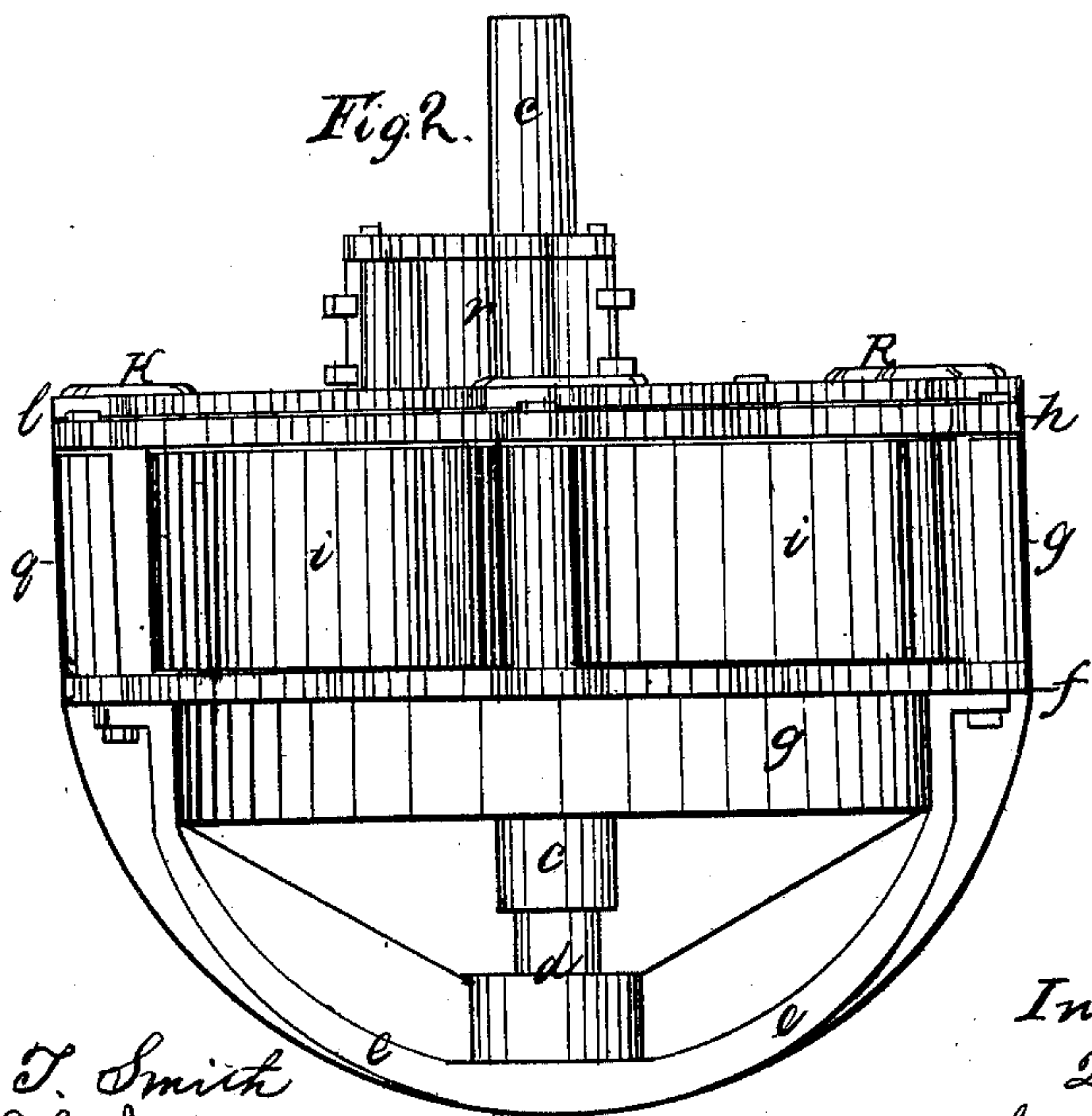
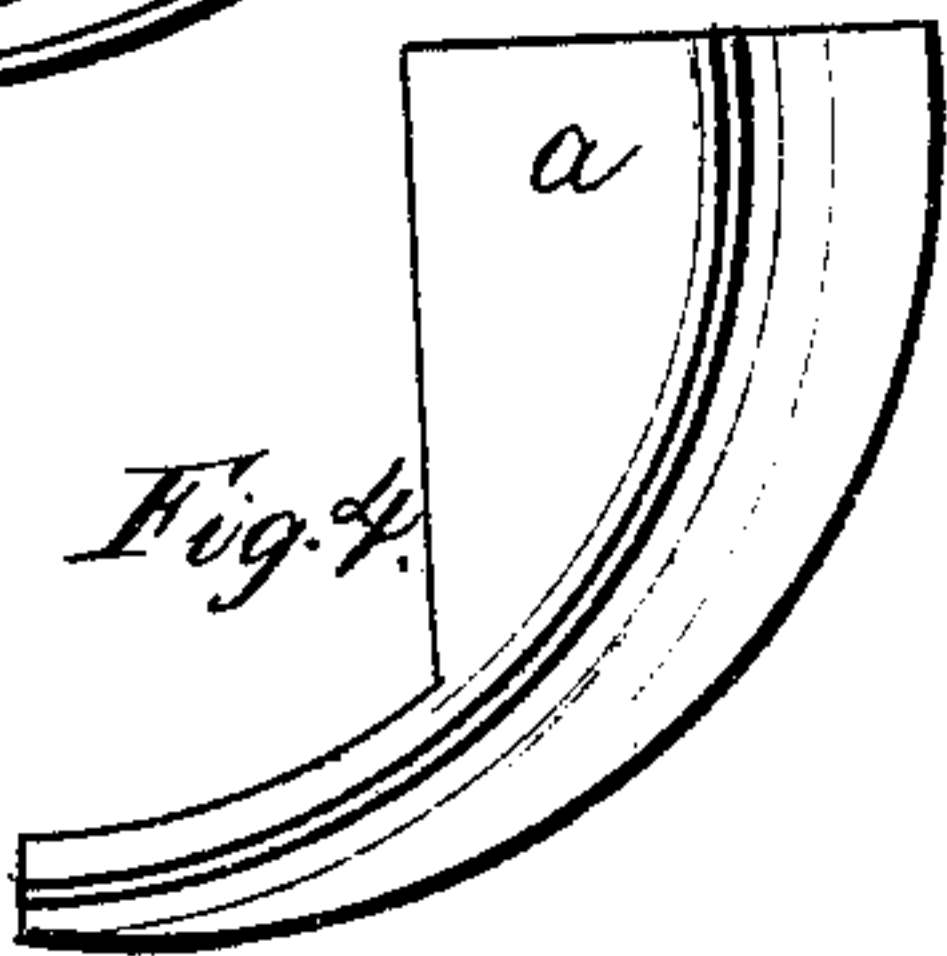
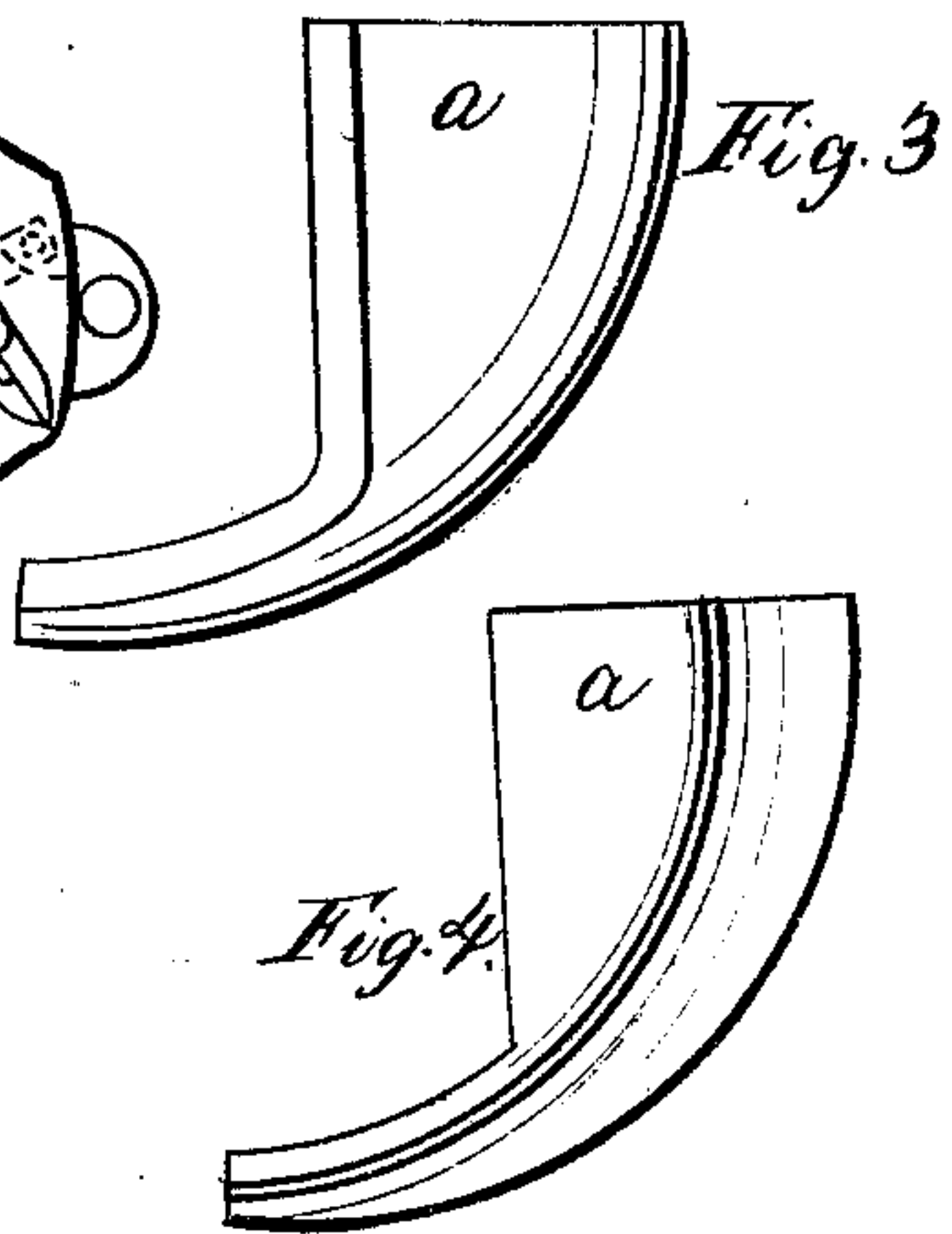
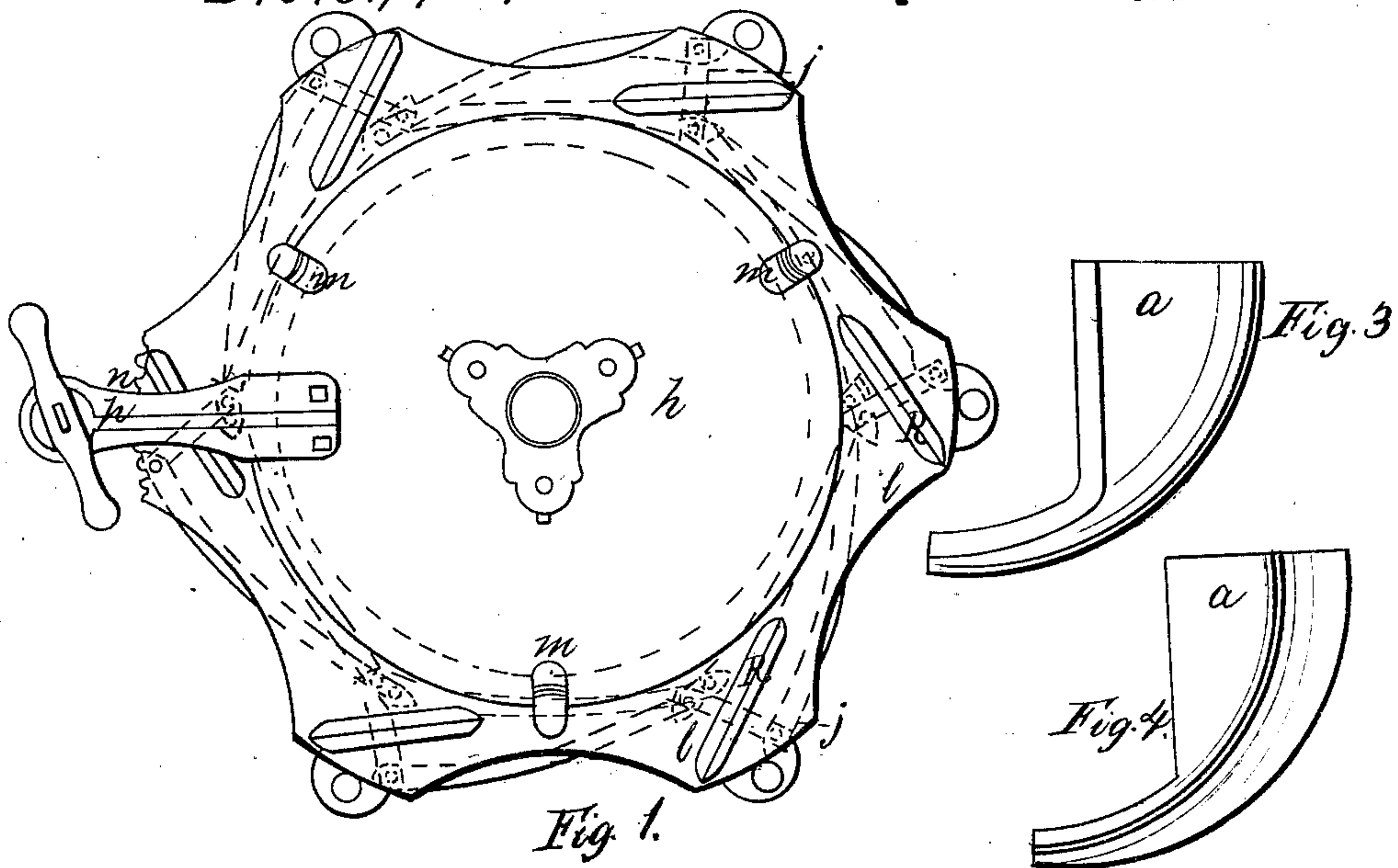
2. Sheets. Sheet. 1.

T. M. Fuller,

Turbine Wheel.

No. 91,430.

Patented June 15. 1869.



Witnesses.

T. Smith  
L. Jones

Inventor  
T. M. Fuller  
By Atty. T. D. Evans

2. Sheets. Sheet. 2.

T. M. Fuller,

Turbine Wheel.

No. 91,430.

Patented June 15, 1869.

Fig. 5.

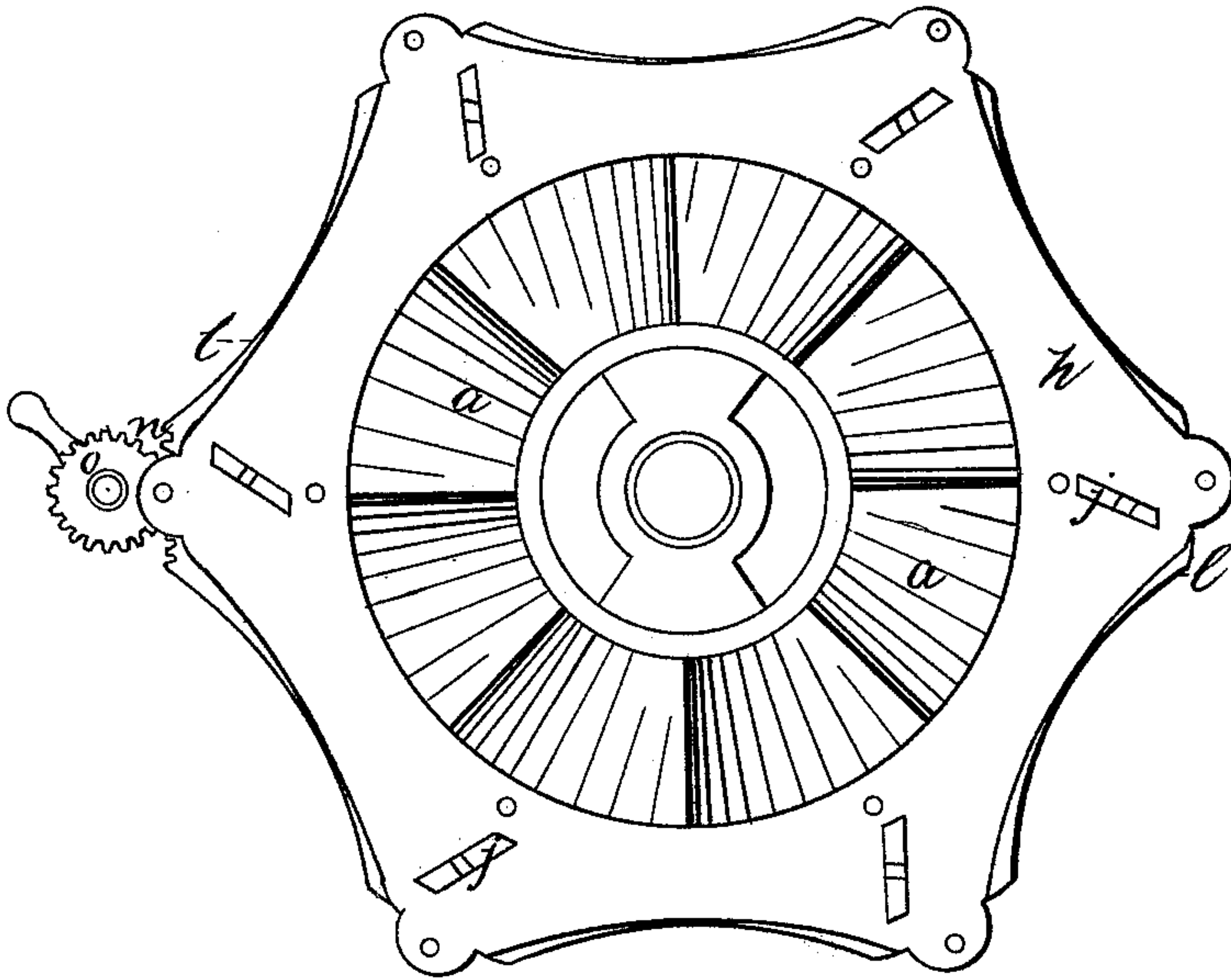
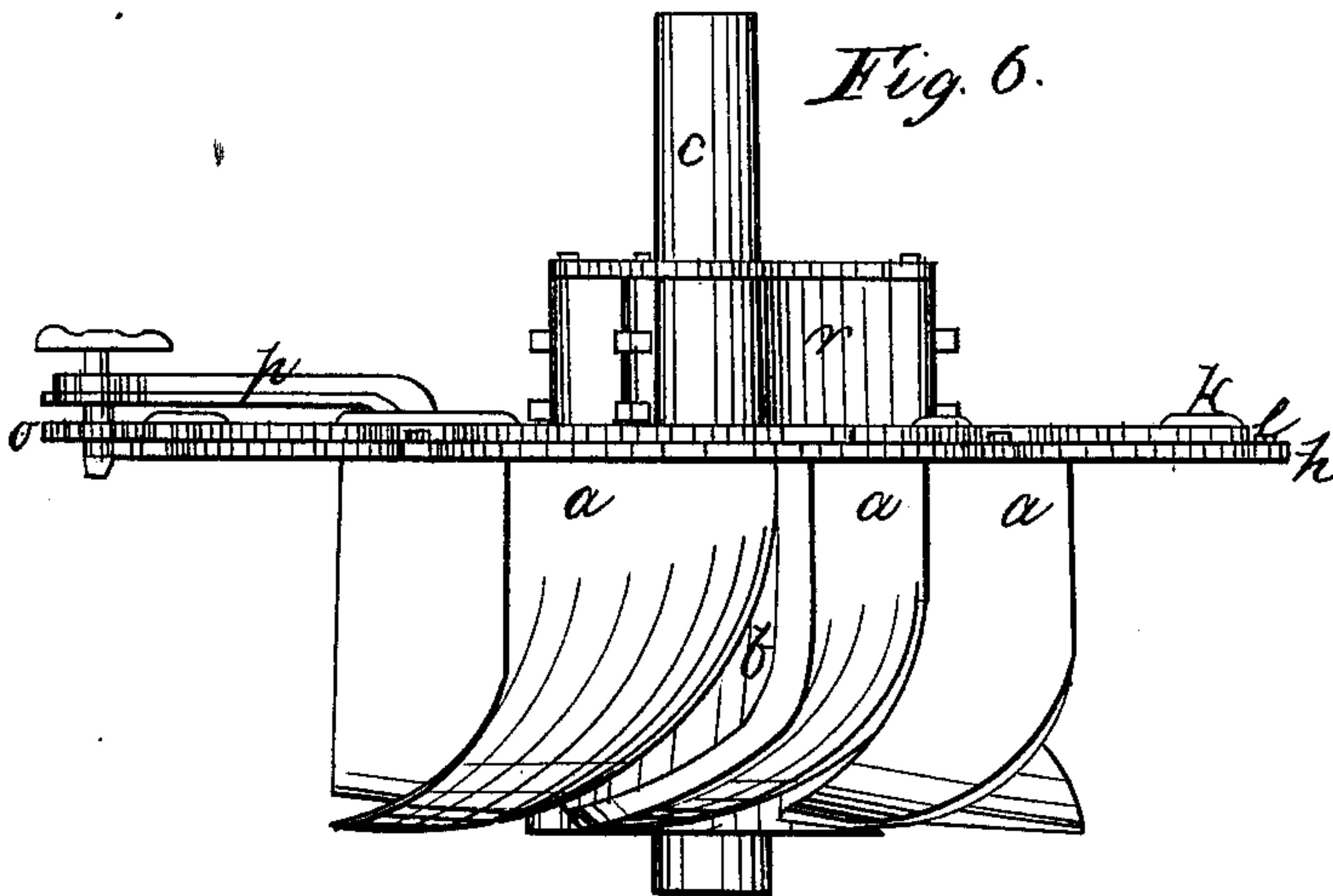


Fig. 6.



Witnesses.

T. Smith  
L. Jones

Inventor

T. M. Fuller  
by Atty. T. J. Everett



# United States Patent Office.

THEODORE M. FULLER, OF HAINESVILLE, NEW JERSEY.

*Letters Patent No. 91,430, dated June 15, 1869.*

## IMPROVEMENT IN TURBINE 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, THEODORE M. FULLER, of Hainesville, in the State of New Jersey, have invented a certain new and useful Improvement on Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters and marks thereon, which said drawings form part of this specification, and show, by the several figures thereof, a water-wheel, and parts of the same, constructed under my invention—

Figure 1 being a top view of the wheel;

Figure 2, a side view;

Figures 3 and 4, views of one of the buckets;

Figure 5, an underneath view, with the bottom plate and spindle-bearing removed; and

Figure 6, a side view of the wheel, the gates and bottom parts being removed.

In all of these figures, where like parts are shown, like marks and letters are used to indicate the parts.

This wheel is of the horizontal kind, and is intended to be placed in the flume, or penstock, and is peculiarly adapted for low heads of water.

As will be noticed, there are several buckets affixed to the hub of the spindle or shaft, and several gates surrounding the buckets, which are adjustable, to regulate the ingress of the water.

The bucket *a* may be cast hollow, and the buckets and the hub *b* may, in some instances, be cast in one piece.

These buckets are of a peculiar form, (see figs. 3 and 4,) more particularly the back part, being rounded, and the face or front part nearly tangential and vertical, except that the lower part is curved and inclining outward and downward.

This rounding of the back limits the action of the greatest portion of the water to the outer edge of the bucket, where it will exert the most power; while the inclining out of the vertical part of the face increases the space for the water at the point of its greatest force.

The inclining outward of the lower part of the face, or what may be termed the horizontal part, facilitates the discharge of the water at the point where the heaviest portion has its bearing.

These buckets, when made separate from the hub,

will have the surface next to the hub properly curved or recessed, to fit the face of the hub, and will be made fast to the hub by suitable means.

The spindle or shaft *c* has its bearing *d* on the curved cross-bar *e*, which is attached to the plate *f* and rim *g*.

Between this lower plate, *f*, and upper plate *h*, are the gates *i*. The inner ends of the gates have pins, which fit into holes in the plates *f* and *h*, and by which pins they are thus pivoted.

The upper edges of the outer ends of the gates have also pins, the pin of each gate passing through a slot, *j*, in the plate *h*, up into a recess under the covers *k*, of plate *l*.

This plate *l* is held on to plate *h* by lugs *m*. For a short distance, *n*, the edge of plate *l* is toothed, into which fit the teeth of the wheel *o*, the shaft of which has a bottom bearing in a supporting-bar between the plates *f* and *h*, and an upper bearing in the bar *p*, which extends from and is secured to the top of plate *h*.

The turning of the wheel *o* will move the plate *l*, and through it the outer ends of the gates, thus closing or opening the passage for the water between the gates to the wheel, or diminishing or increasing this passage, as may be required.

Between the plates *f* and *h*, at suitable points for support, are upright bars or piece *q*, and around the spindle or shaft is a suitable support and stuffing-box, *r*.

Having thus set forth my invention,

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

1. The bucket *a*, with the rounded back and nearly tangential and vertical face, but the lower part thereof curved outward and downward, as herein set forth.

2. The arrangement of the wheel *o*, plates *l* and *h*, in their relation to the outer end of the gates *i*, and for operating said gates, as herein recited.

This specification signed, this 17th day of October, 1868.

THEODORE M. FULLER.

Witnesses:

WILLIAM CLARK,  
HIRAM C. CLARK.