

J. Hathaway. *Turbine Wheel.*

N^o 94,821.

Patented Sept. 14, 1869.

Fig. 1.

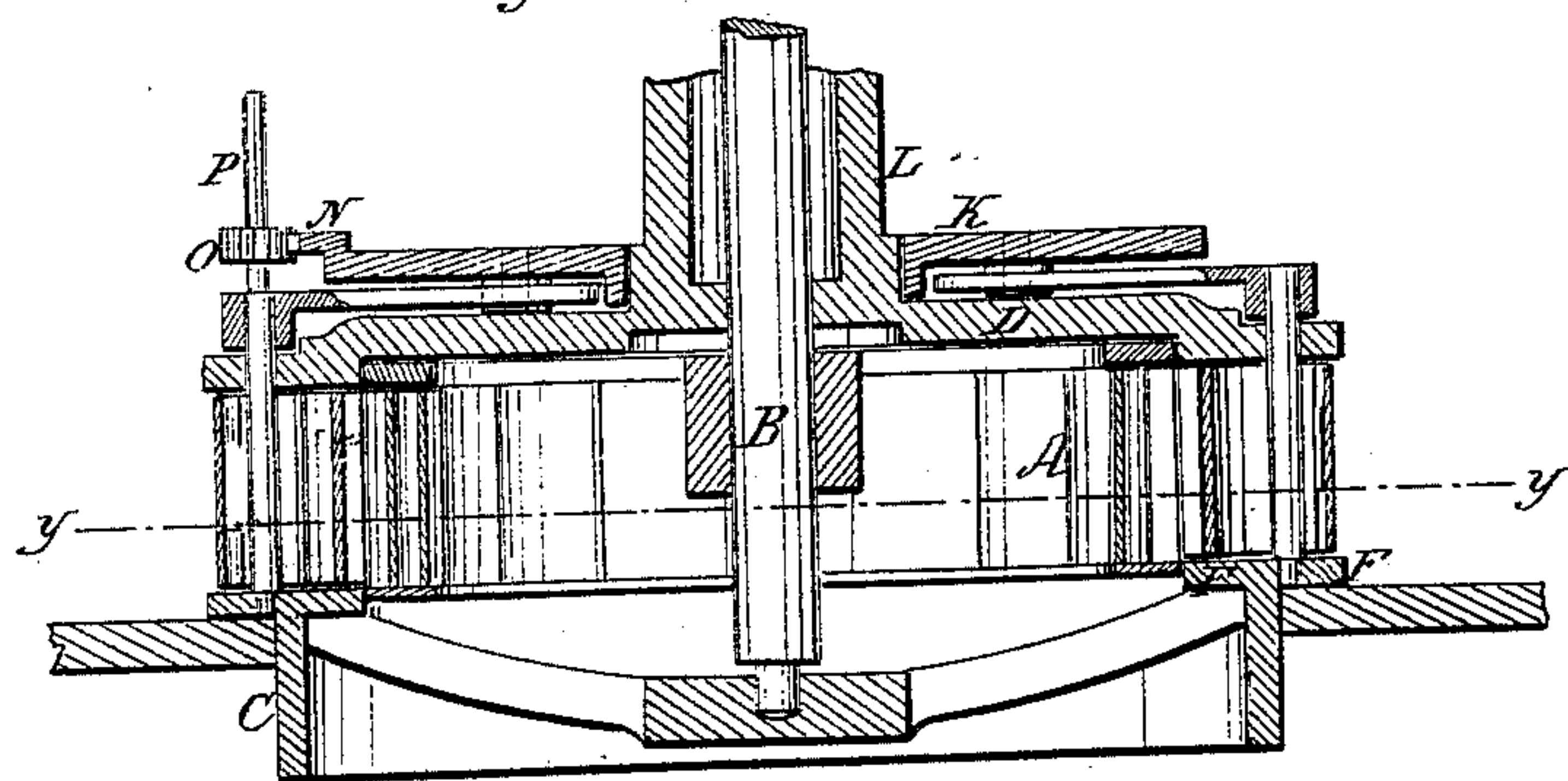


Fig. 2.

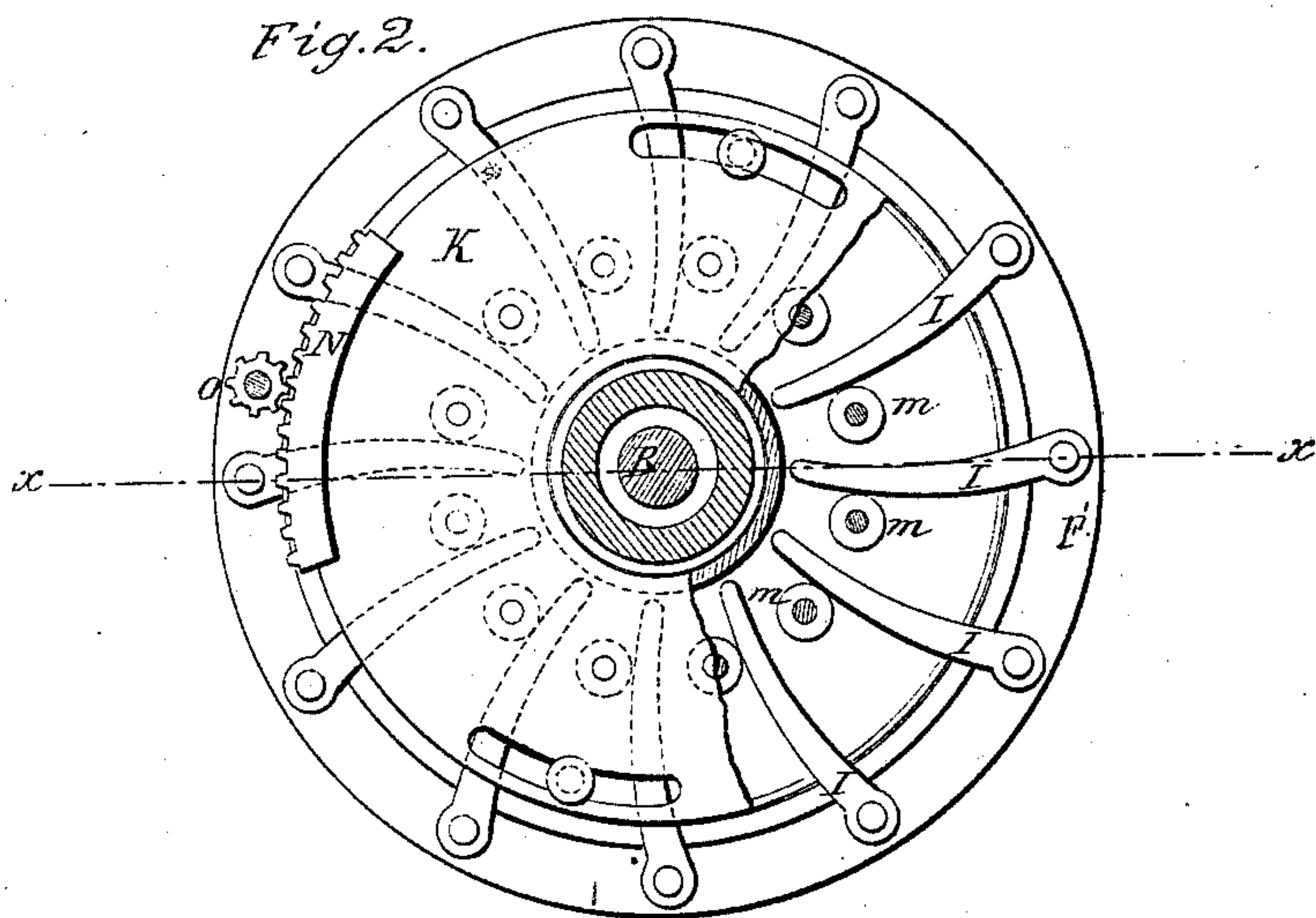
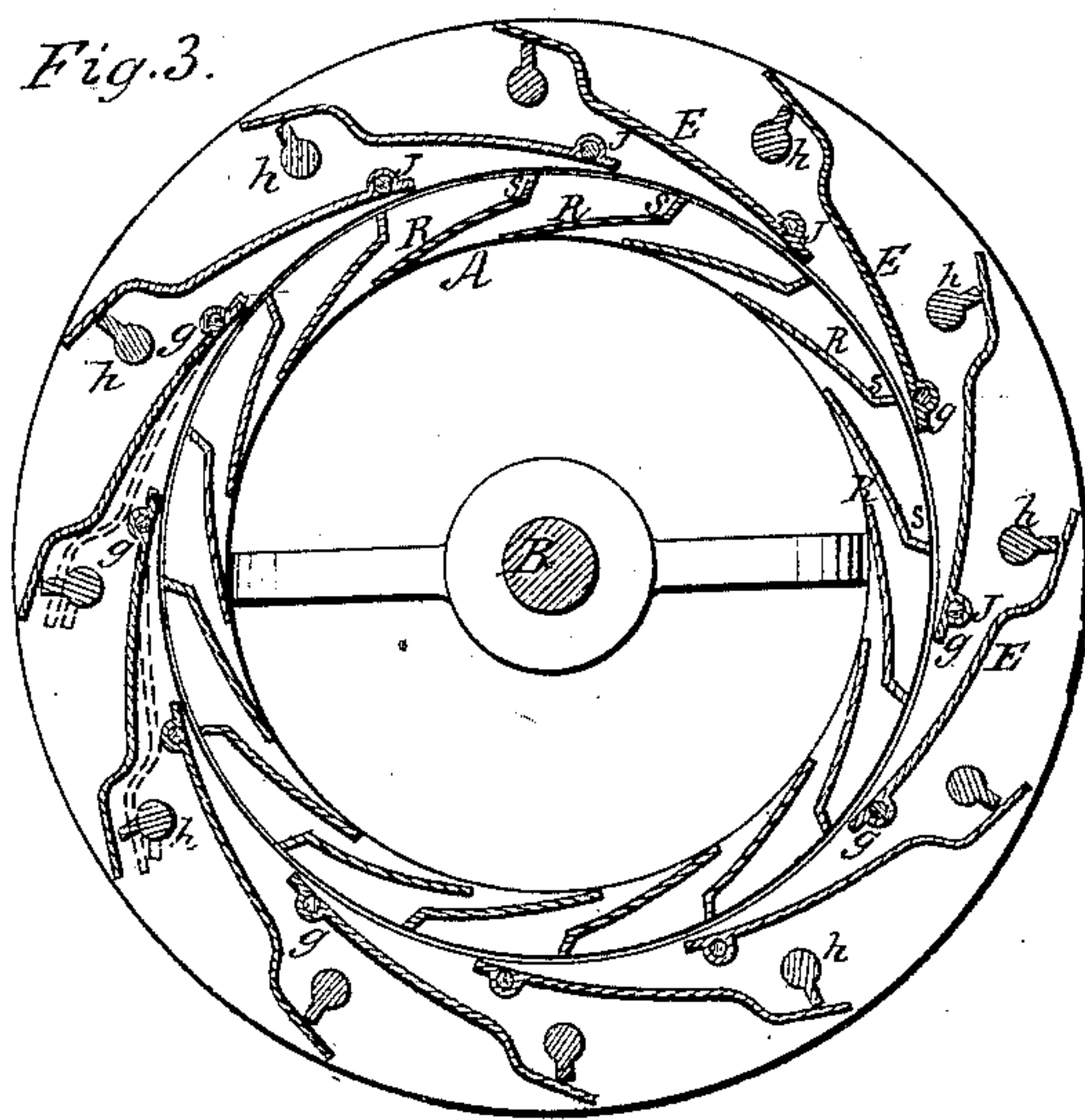


Fig. 3.



Witnesses

A. Bennewendof

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Inventor.
J. Hathaway
per Munn & Co
attys

United States Patent Office.

JOSEPH HATHAWAY, OF WOODSTOCK, VERMONT.

Letters Patent No. 94,821, dated September 14, 1869.

IMPROVEMENT IN 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, JOSEPH HATHAWAY, of Woodstock, in the county of Windsor, and State of Vermont, have invented a new and useful Improvement in Water-Wheels; 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 drawings, forming part of this specification—

This invention relates to new and useful improvements in water-wheels, whereby many of the objections to the ordinary arrangement of the chutes and parts connected therewith are obviated; and consists in the method of hanging, adjusting, and operating the chutes, and in the form of the buckets of the wheel, and their arrangement in regard to the chutes, as will be hereinafter more fully described.

In the accompanying plate of drawings—

Figure 1 is a vertical section of the wheel through the line *x x* of fig. 2.

Figure 2 is a top view, with a portion of the top plate broken away, to show the levers for operating the chutes.

Figure 3 is a horizontal section of fig. 1, through the line *y y*.

Similar letters of reference indicate corresponding parts.

A represents the wheel, which is attached to a vertical shaft, B, and confined in the ordinary casing, which consists of a lower flanged cylinder, C, which is placed through the floor, as represented in fig. 1, and an upper plate, D. The plate and the cylinder are connected together by bolts or screws.

E represents the chutes.

The chutes are in width sufficient to fill the space between the plate D and the flange F F' of the cylinder, and still be allowed to move freely for enlarging, diminishing, or closing up entirely the discharge-orifices.

These chutes are pivoted near their inner ends, as seen at *g*. Their other ends are left free.

h represents posts, whose lower ends are placed in orifices in the flange F' of the cylinder C. They pass up through the plate D, to the upper ends of which the levers I are attached, as seen in fig. 2.

Between the flange F' and the plate D, these posts are cams, as seen in fig. 3.

It will be seen that when the cams are turned by the levers against the chutes, the water-spaces J will be increased in area, and when the cams are turned in the other direction, the pressure of the water upon

their outer sides will close them up, as seen in the drawing in red color.

K is a plate, which is passed down over the neck L of the plate D, the collar of which rests on D, as seen in fig. 1.

m represents rolls, which are attached to the under side of the plate K by pivots. These rolls occupy the spaces between the levers I, so that when the plate K is moved, or partially revolved, the levers will be moved, which will cause the cams to act against the chutes, to throw them out against the pressure of the water and open the water-spaces.

The plate K is partially rotated by means of the rack N (which is fast to it) and the pinion O on the vertical shaft P.

A crank or hand-wheel is fitted to the top of the shaft P, by which the rack and pinion are operated. The plate K is kept down and in place by means of the screws T, which enter the plate beneath and stand in slots *u* in the plate. The heads on the screws prevent the plate from raising, while the length of the slots *u* limit the extent of its movement.

R represents the buckets of the water-wheel. The water acts mainly against the lips S of the buckets. The power is applied, it will be seen, where it will produce the greatest effect.

By this arrangement, the quantity of water used on the wheel may be regulated with the greatest nicety, while the amount of power required for adjusting the chutes is very slight, in consequence of the power gained by the rack and pinion, and the absence of friction in moving the levers I.

Having thus described my invention,

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

1. The chutes E and cam posts *h*, constructed, arranged, and operating substantially as and for the purposes shown and described.

2. The levers I, and the plate K, with the rolls *m*, combined, arranged, and operating substantially as described, for the purposes set forth.

3. In combination with the chutes E, arranged and operating as described, the lips S on the buckets R, substantially as and for the purposes set forth.

The above specification of my invention signed by me, this 22d day of April, 1869.

JOSEPH HATHAWAY.

Witnesses:

FRANK BLOCKLEY,
ALEX. F. ROBERTS.