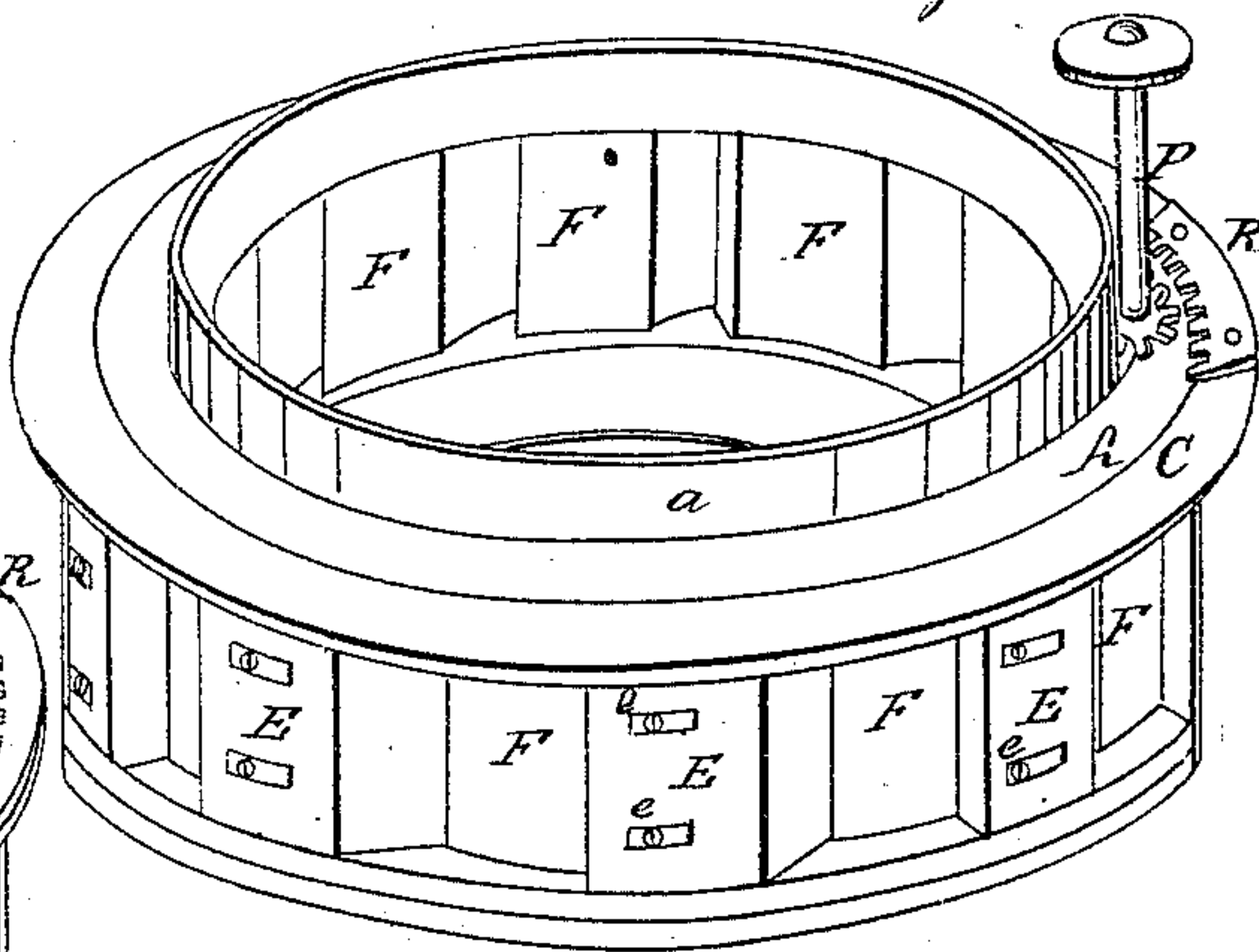


*R. R. Royer*  
*Turbine Wheel.*

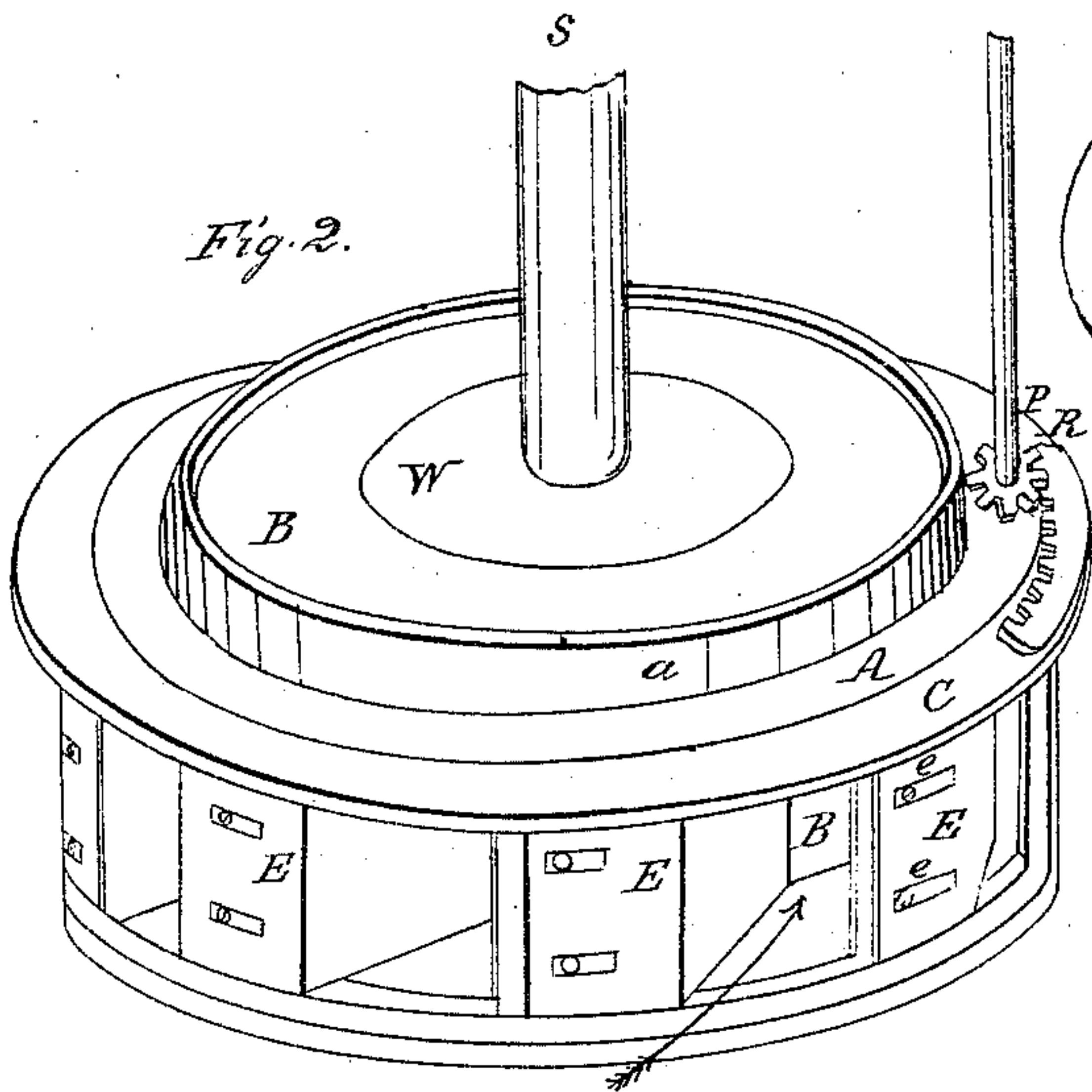
*N<sup>o</sup> 94,777.*

*Patented Sept. 14, 1869.*

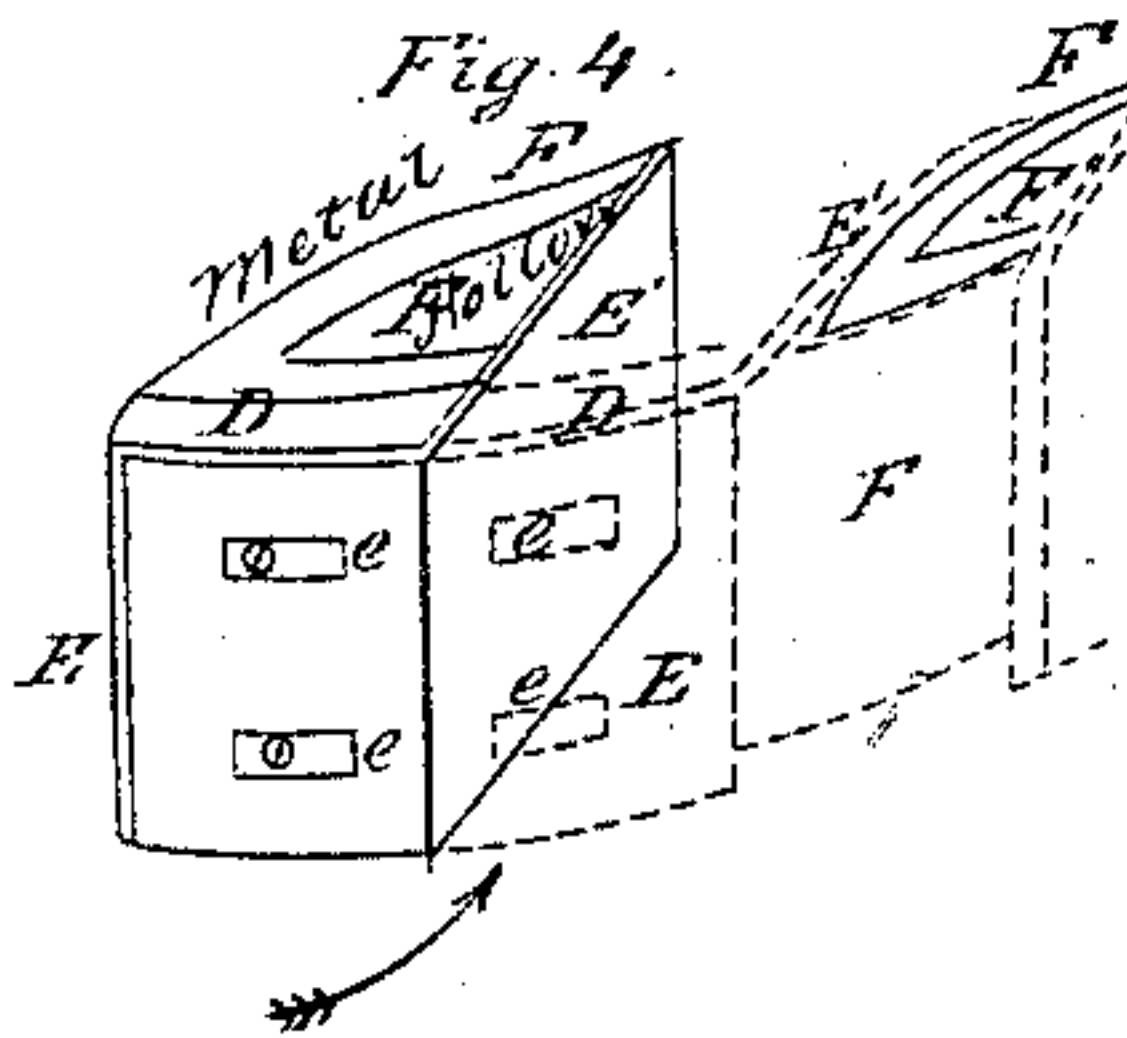
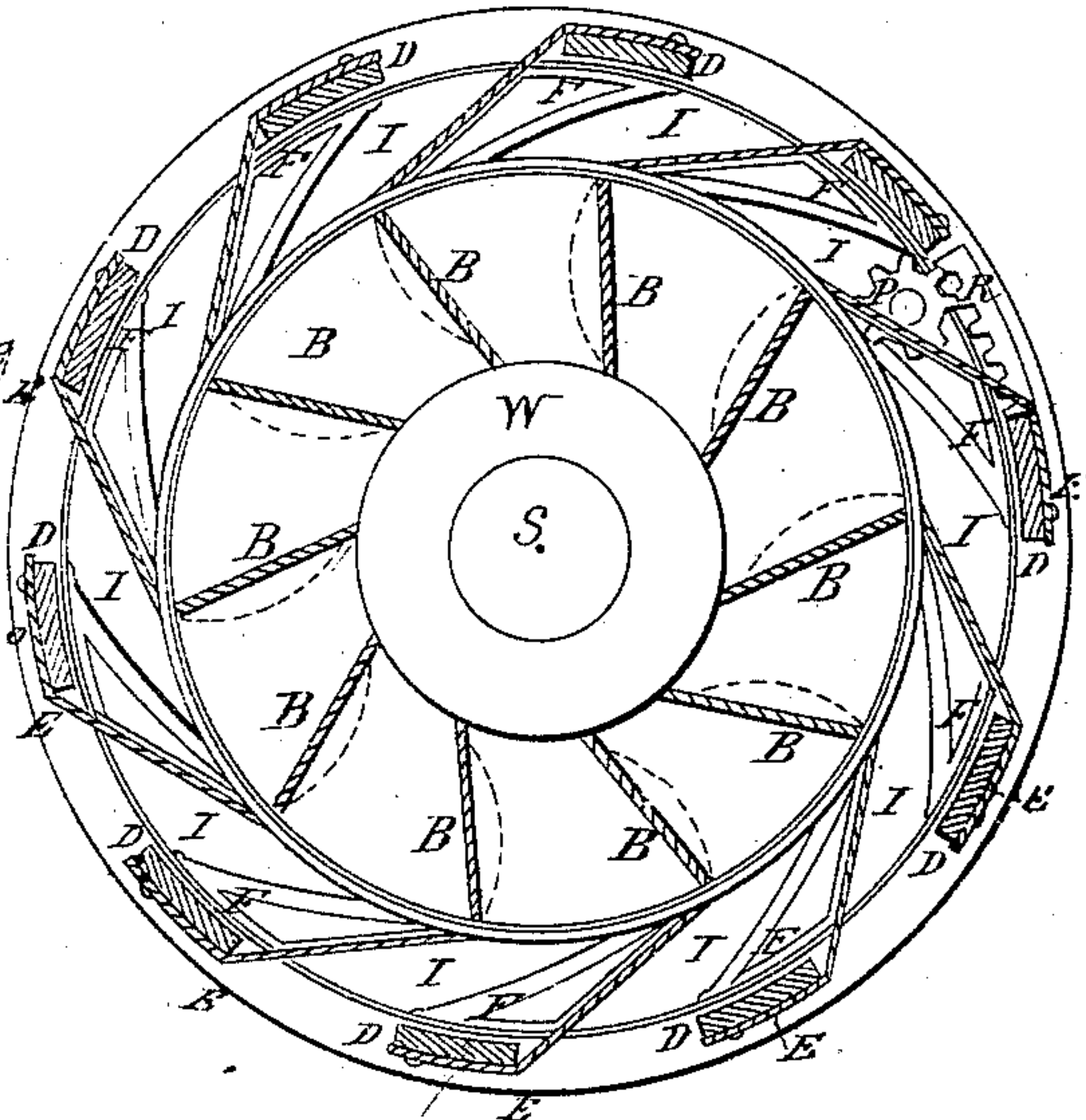
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses.

*W. K. Johnson*  
*John G. Worth*

Inventor.

*Reuben R. Royer*



# United States Patent Office.

REUBEN R. ROYER, OF EPHRATA, PENNSYLVANIA.

Letters Patent No. 94,777, 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, REUBEN R. ROYER, of Ephrata, in the county of Lancaster, and State of Pennsylvania, have invented a new and improved Mode of Adjusting the Chutes and Guides for Admitting Water to Horizontal Water-Wheels; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the stationary ring, with its guides, and the moveable external ring, with their flanges and connections, with the inlets closed.

Figure 2, the same, showing the water-wheel and shafts, the inlets shown open.

Figure 3, a plan view of the several parts combined.

Figure 4 illustrates the action of the outer ring. (Rack and pinion not shown in this, for moving said ring.)

The nature of my invention consists in the arrangement and construction of a slotted guide-plate for each chute or inlet, all operated in unison, to graduate the amount of water to be let in through the channels, by means of a pair of annular flanges, combined, by a rim, with a series of openings or slots, forming an external ring, with a rack at one point, for a pinion on the stationary chute-case or inner ring.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the several parts.

Figs. 1, 2, and 3 show the several combinations.

Any horizontal water-wheel, W B, can be employed, into which the water enters on the side.

s is the shaft, the penstock not shown, as the novelty of my invention is confined to the parts shown by fig. 1, which shows a stationary ring or case, A, with a raised inner flange, a, above and below vertically, and side flanges for the intermediate guide-ways or curves F, constituting the channels I between them.

These sections F, or ways, can be cast so as to save metal, as shown by fig. 4. The outer face on the periphery of said sections F, of the ring or case A, is equal to the slots or openings left in the outer or movable ring C, which, when fully opened, coincide, allowing the water to flow in freely, through both the outer and inner rings A C, to impinge against the buckets B of the wheel W. A ratchet-pinion, P, with its shaft,

extending above the penstock, is also affixed to the top of said stationary ring, or case of chutes, or sluice-openings.

A segmental rack, R, is affixed on the upper face of the movable ring C, with its sluice-openings and guide-plates E attached to the upright portions D, by means of screw-bolts, made adjustable by the slots e, in such a manner that, by a turn on the shaft P or rack-pinion, the whole ring is revolved so far at least as will effectually close up the inlets I, by bringing the side E' of the guide from contact with the one guide-way F to that of the adjoining one F', (fig. 4,) so that the column D, with the outer face of the slotted plate E, fills up the channel or inlet I, between the guide-ways aforesaid. Thus any portion of said channels can be cut off to any desired amount with great ease and uniformity, without the intervention of links, hinges, or complicated machinery.

These guides or gate-plates E E' are easily adjusted by means of the slots, and the whole found to constitute a very simple and efficient device for regulating the amount of water, and may consist of from ten to twenty openings, according to the number of buckets, the area, curve, and position determined, so as to adapt the same to the choice of the water-wheel selected in accordance with the established theory.

I am aware that sliding rings or collars, operated by rack and pinion, are not new; I am also aware that in a vertical adjustment to regulate the water-space, a gate, made adjustable by set-screws and slots, is claimed, in combination with an additional bucket between the usual buckets. Such I do not claim; nor do I claim adjustable chute-boards, extending down between the guide-curves and parallel therewith, in the manner shown in patent No. 61,299.

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

The arrangement and construction of the slotted plates E E' on the periphery of a movable ring, C, with intermediate side openings, in combination with the stationary or inner ring or case A, rack and pinion P R, operating in the manner and for the purpose specified.

REUBEN R. ROYER.

Witnesses:

WM. K. SELTZER,  
JOHN G. WORTH.