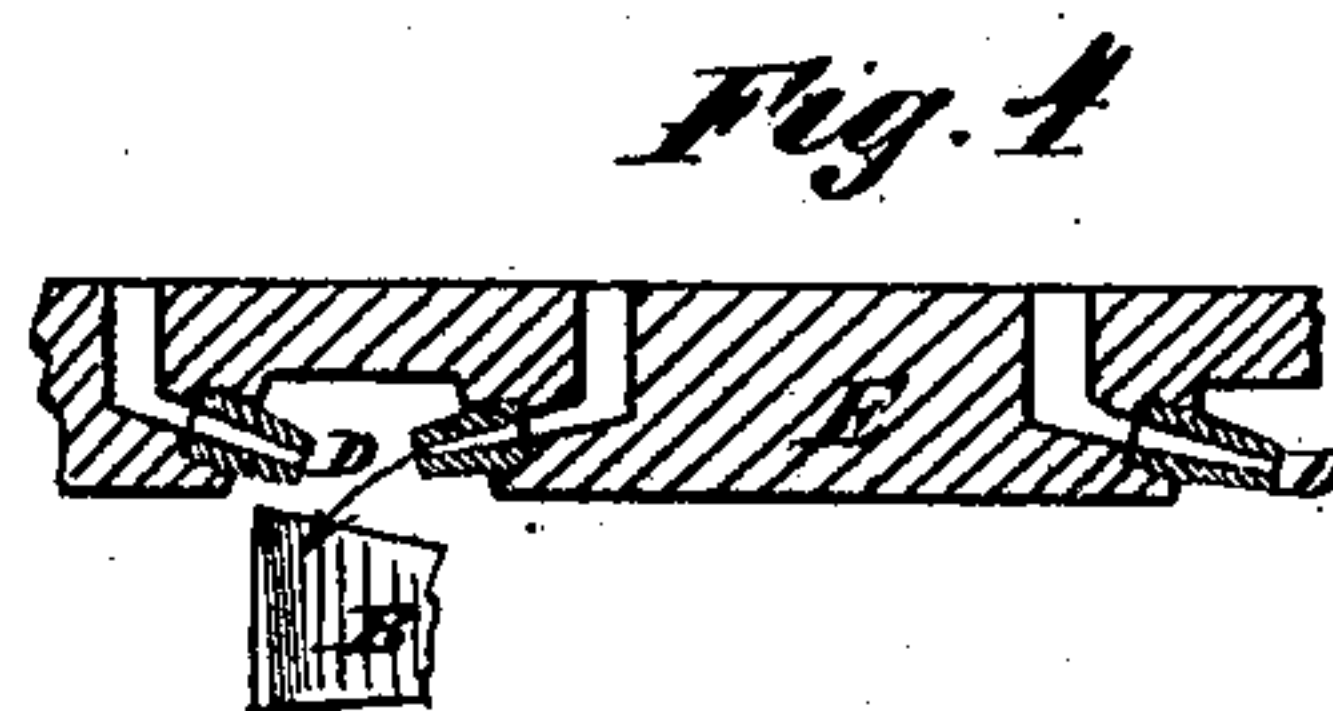
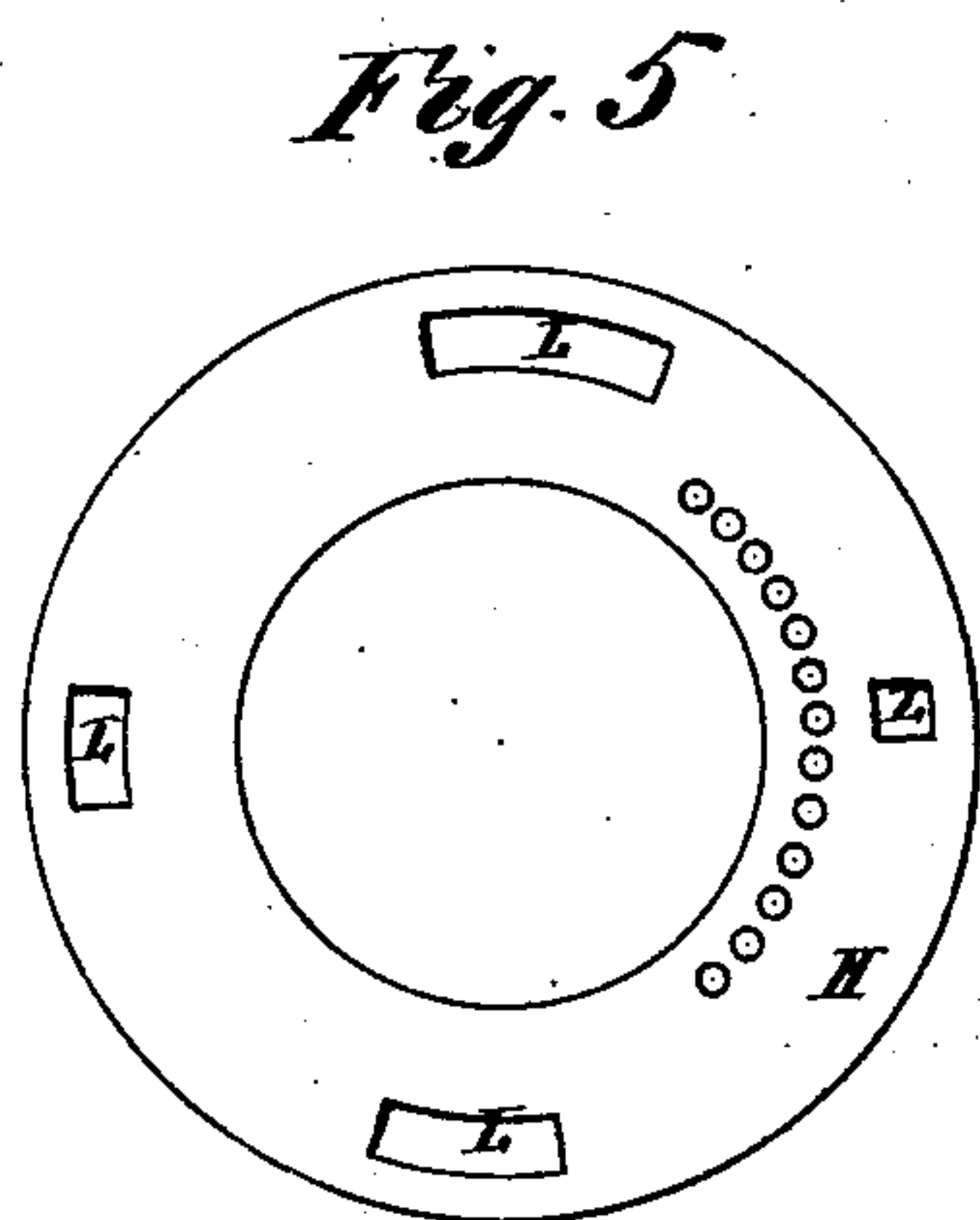
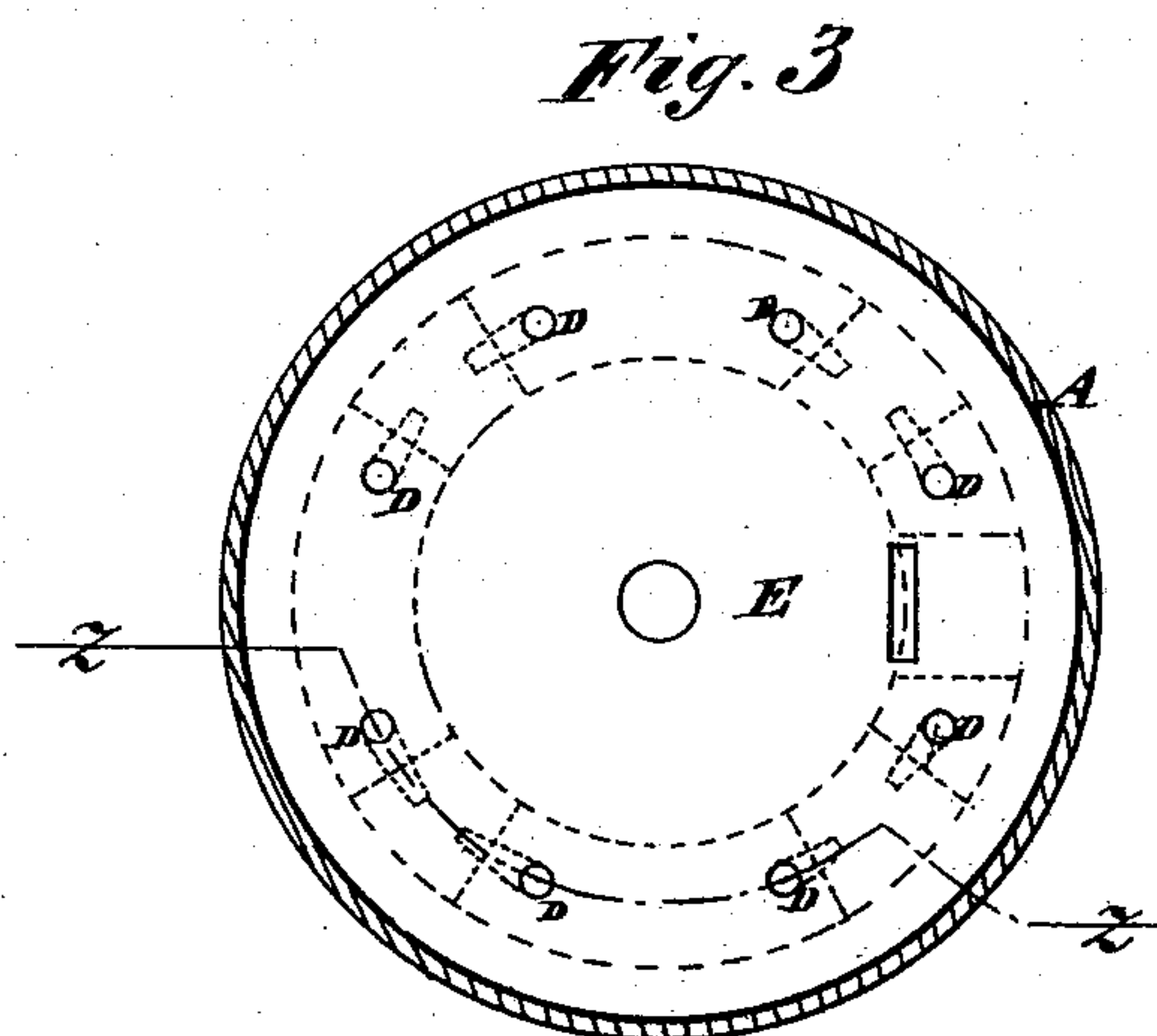
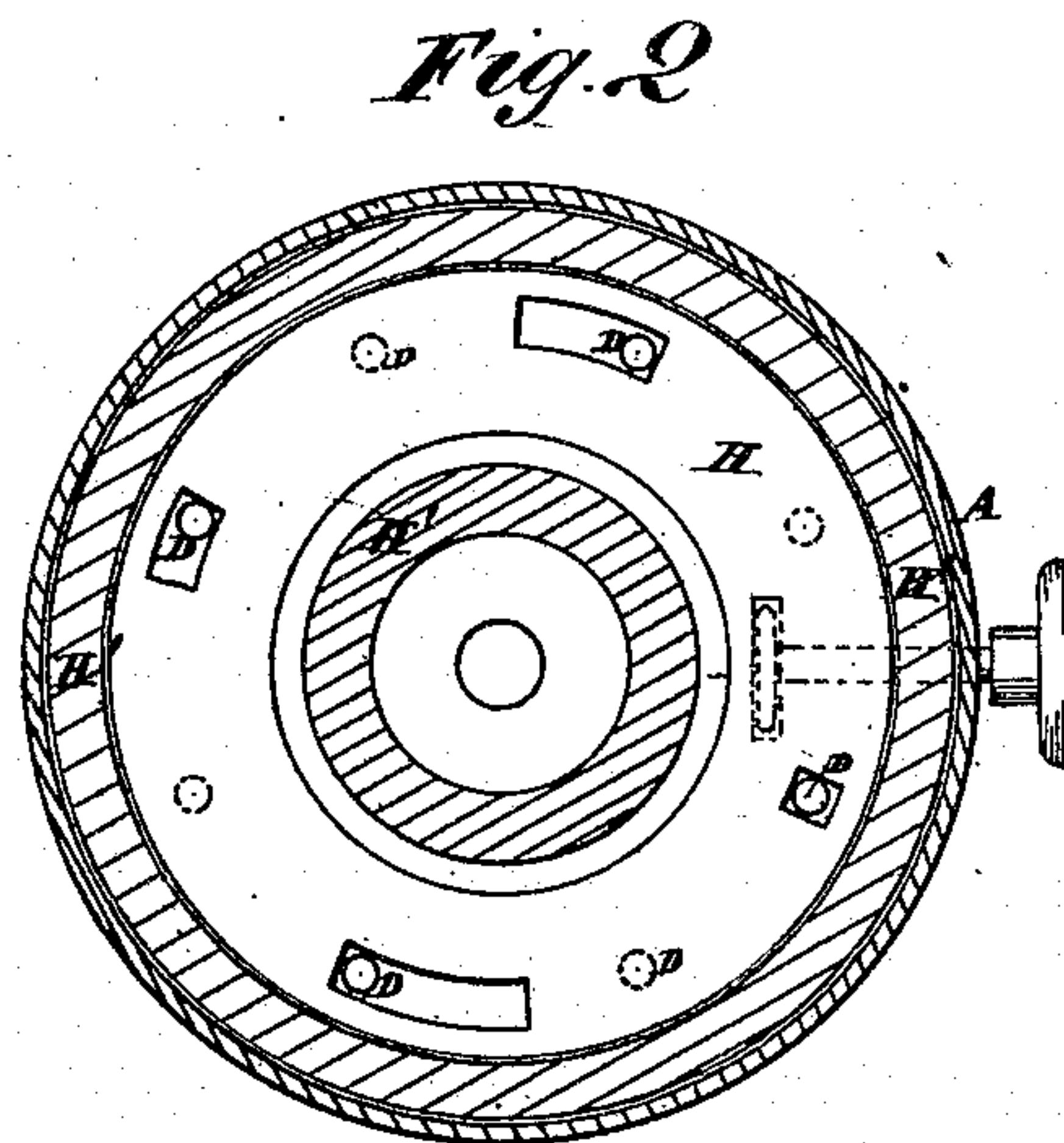
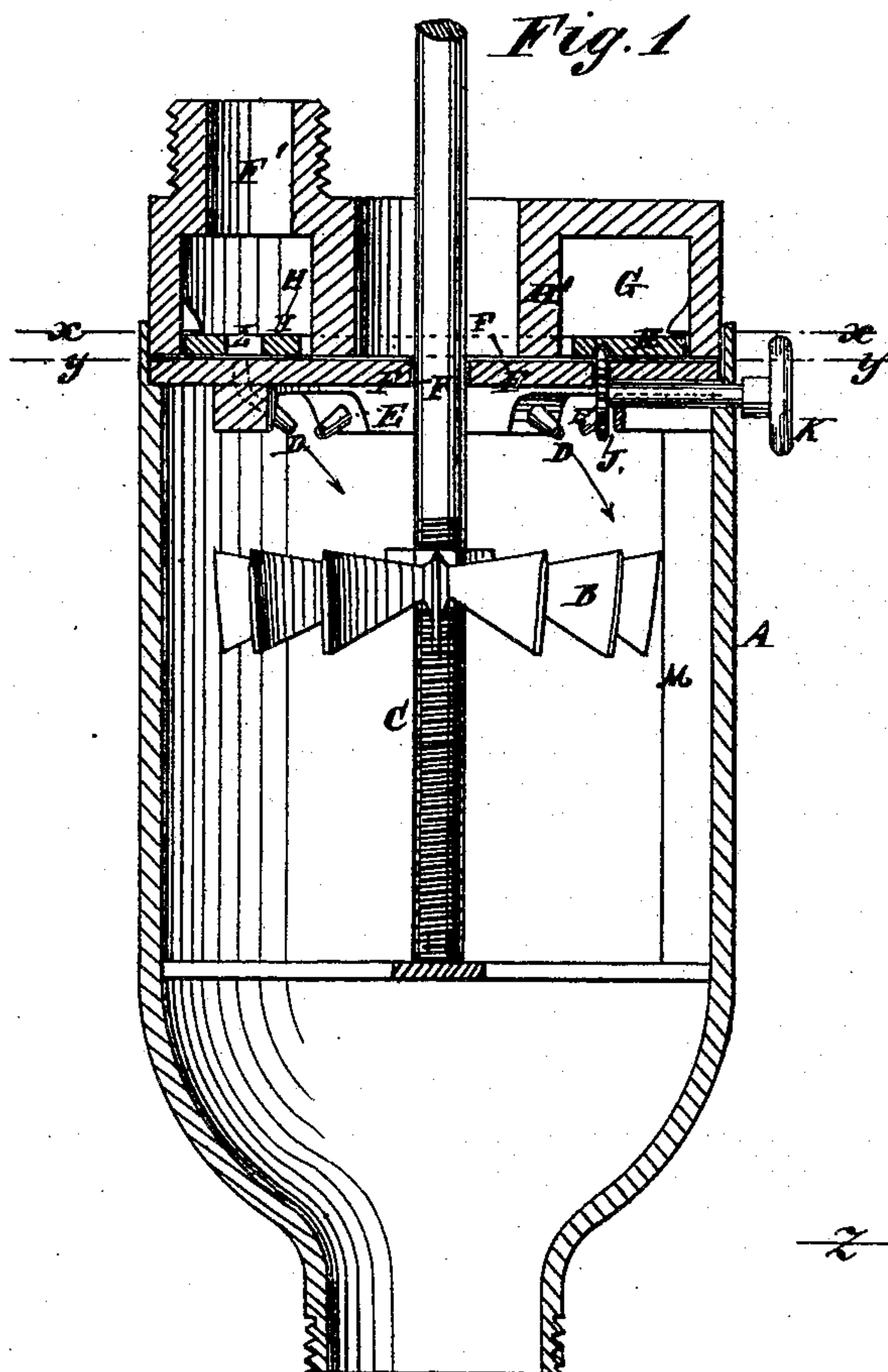


C. H. STURGES.

Water-Wheel.

No. 164,495.

Patented June 15, 1875.



WITNESSES:  
*A. W. Almquist*  
*A. J. Perry*

INVENTOR:  
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 ATTORNEYS.

# UNITED STATES PATENT OFFICE.

CHARLES H. STURGES, OF SARATOGA SPRINGS, NEW YORK.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **164,495**, dated June 15, 1875; application filed May 8, 1875.

*To all whom it may concern:*

Be it known that I, CHARLES H. STURGES, of Saratoga Springs, in the county of Saratoga and State of New York, have invented a new and Improved Water-Wheel, of which the following is a specification:

My invention consists of blades projecting radially from a vertical shaft in a case employed merely to conduct the water away, with a series of jet-pipes in the bottom of the reservoir above, inclined to discharge the water against the sides of the blades at little more than a right angle to the line of escape from the buckets, with which jet-pipes there is a gate in the reservoir, contrived to open the jets in succession, so as to regulate the amount of water by the number of jets, and not by the amount of their opening, which gives better results than partial openings would, because the force of the jet is dependent on the perfect form at the issue. The invention also consists of a secondary set of jets discharging in the reverse direction, and contrived to be opened by the same gate when the others are closed, to reverse the wheel.

Figure 1 is a sectional elevation of my improved wheel. Fig. 2 is a horizontal section on the line *x x*. Fig. 3 is a horizontal section on line *y y* of Fig. 1. Fig. 4 is a detail section on line *z z* of Fig. 3. Fig. 5 is a plan of the under side of the gate.

Similar letters of reference indicate corresponding parts.

A represents the case, in which is the wheel, which consists of the radial blades B and the vertical shaft C. D represents the jet-pipes for turning the wheel one way, and E the pipes for turning it the other way. They are fixed in the bottom plate F of the reservoir G, in which the water is received by pipe F'. H is the gate for opening and closing the jets.

It consists of an annular plate fitted by a large hole in the center around the hub H', to be turned by the toothed wheel J and the hand-wheel K. The openings L through this plate, for admitting the water to the jets, differ in length, so that one, two, or more of the jets may be opened in succession, according to the power wanted. The blades are beveled to an edge at the top, to avoid the waste of water that would occur if they were flat on top, and in practice they will be wedge-shaped in horizontal section when the two sets of jets are used, in order to hold the water on the sides better; but when only a single set of jets is used, they may be inclined to the radial lines to have the same effect. M represents a breakwater on one side of the interior of the case, to prevent the water from remaining in and filling up the case by the effect of centrifugal force.

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

1. The combination of a series of jets, D, and a gate contrived to open and close them in succession, with a wheel, B C, substantially as specified.

2. The combination of two reverse series of jets with a wheel, B C, substantially as specified.

3. The combination, with two reverse series of jets, of a gate contrived to open the jets of either series, and successively close the others in the same manner, substantially as specified.

4. The reservoir G, gate H, jets D, wheel B C, and case A, substantially as specified.

CHARLES H. STURGES.

Witnesses:

JOHN FOLEY,  
E. H. PETERS.