

W. & J. BOEKEL.
IMPACT WATER MOTOR.

(Application filed May 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

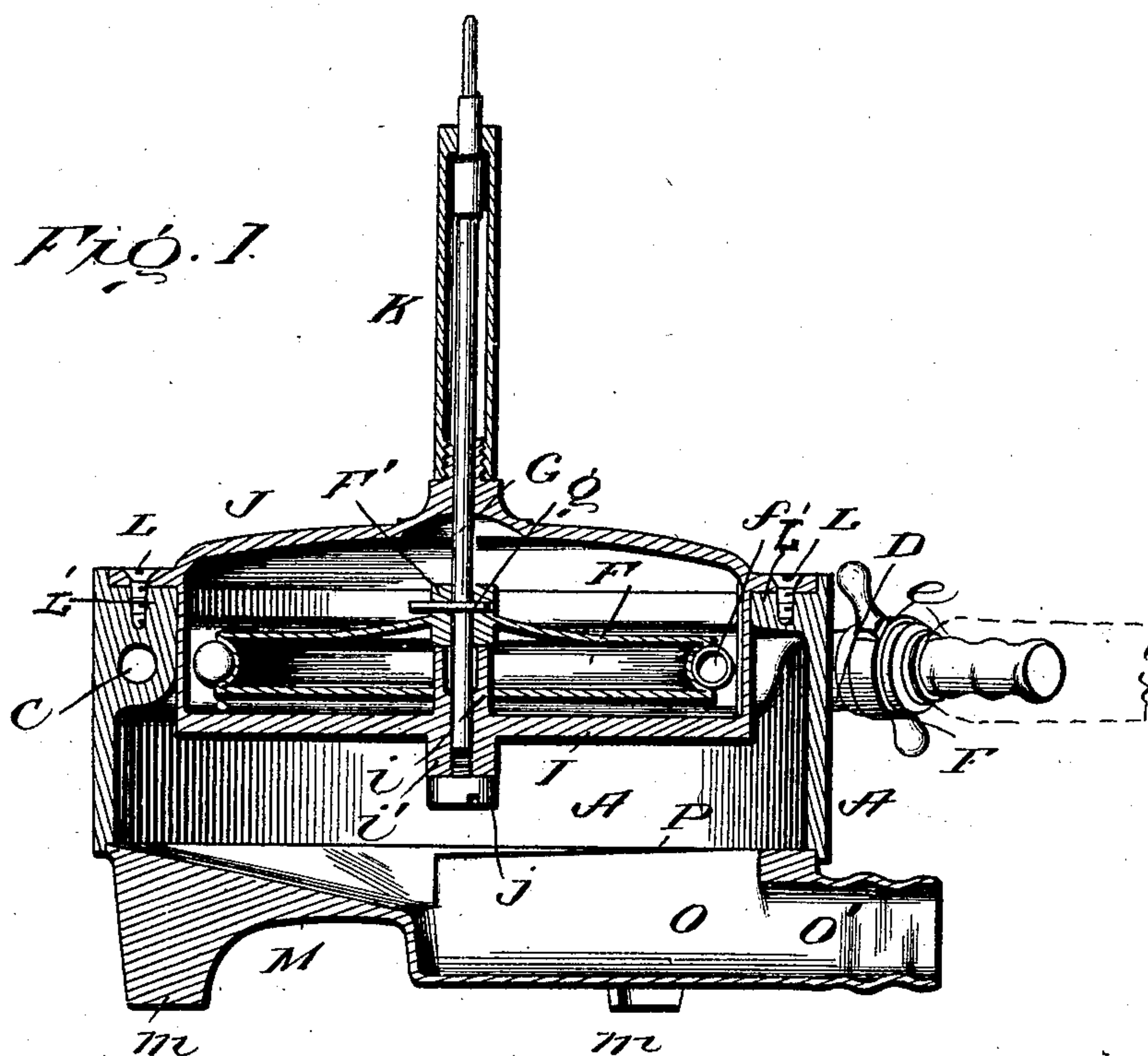


Fig. 2.

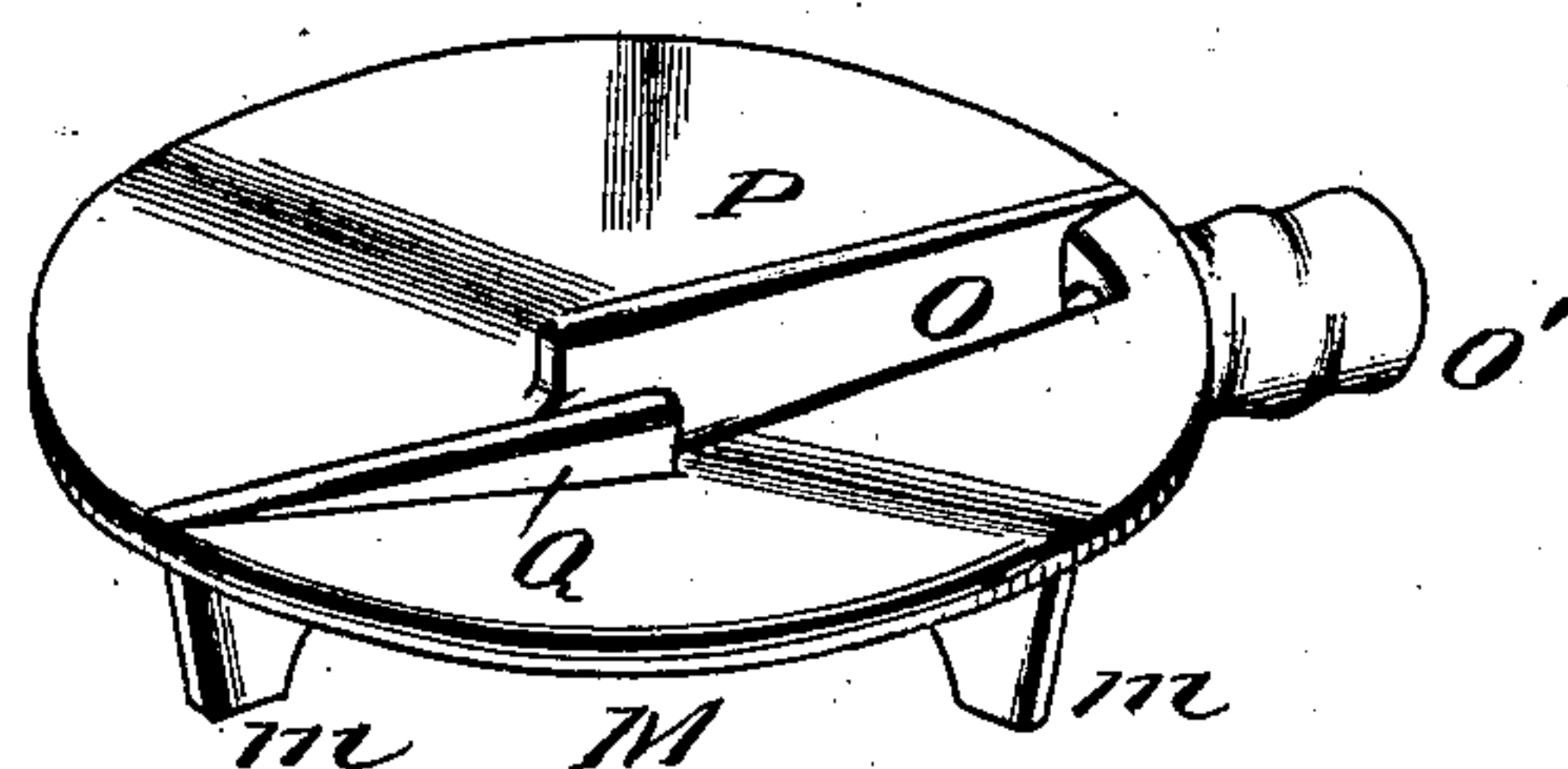
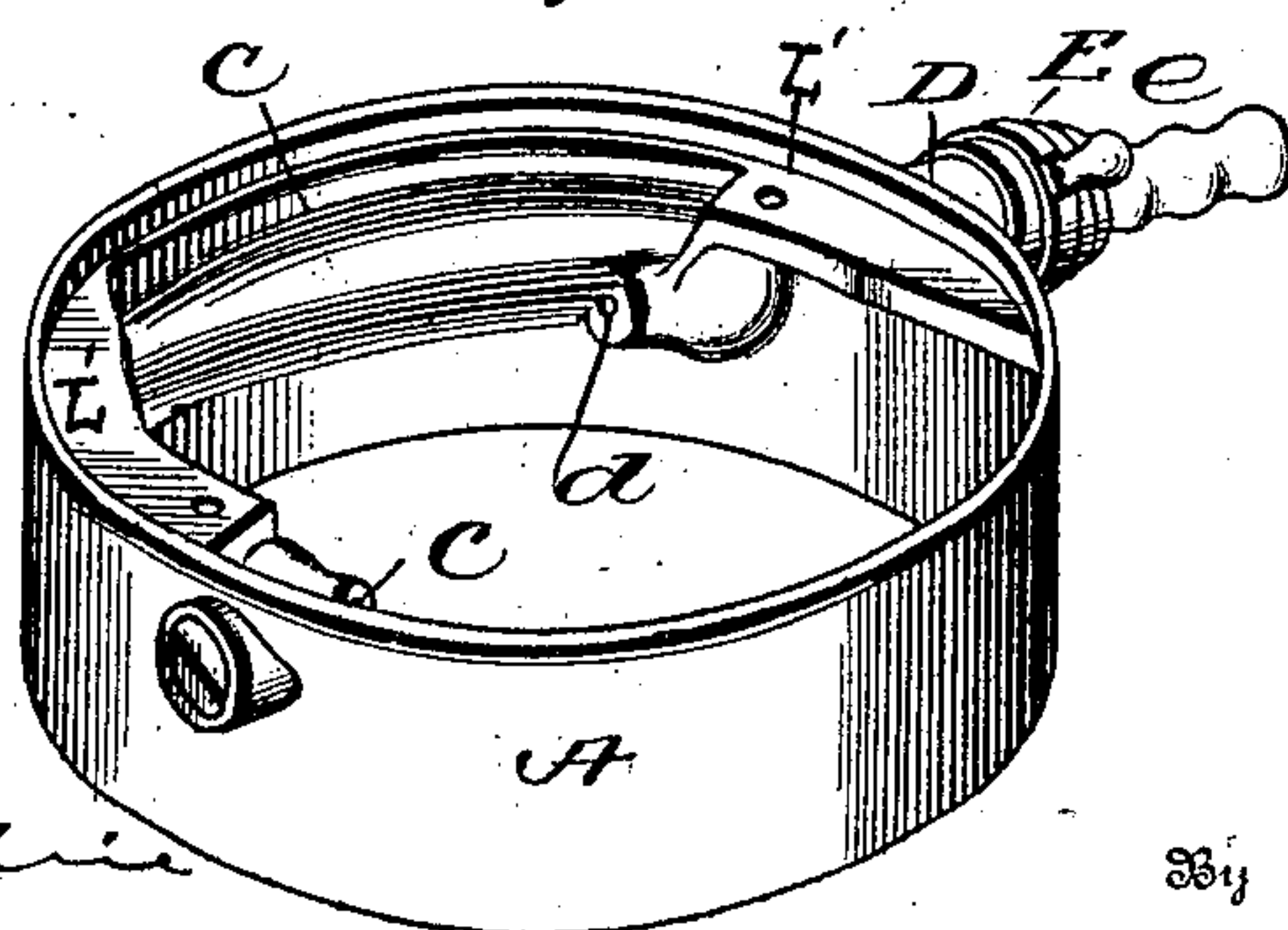


Fig. 3.



Witnesses

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No. 682,664.

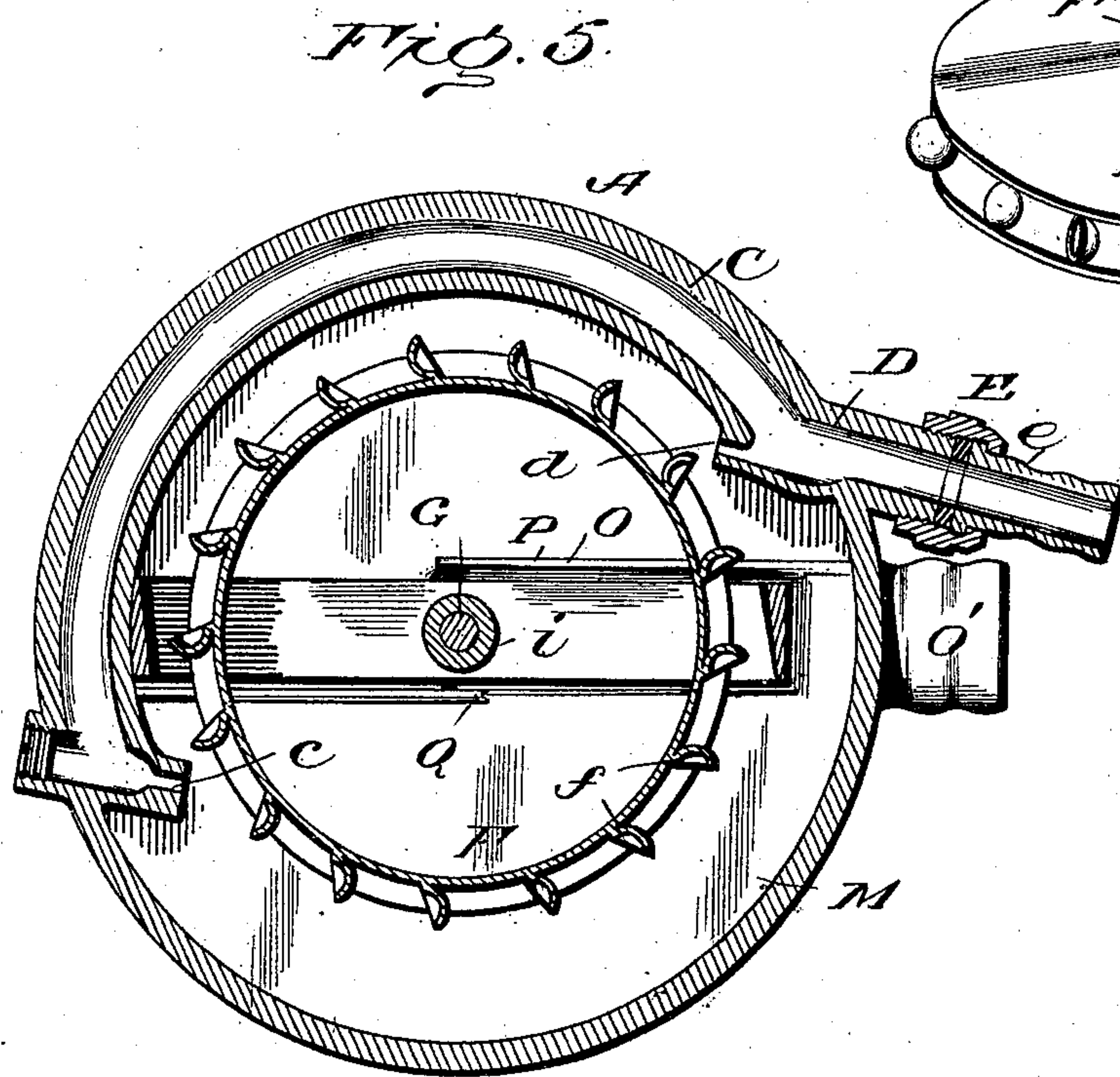
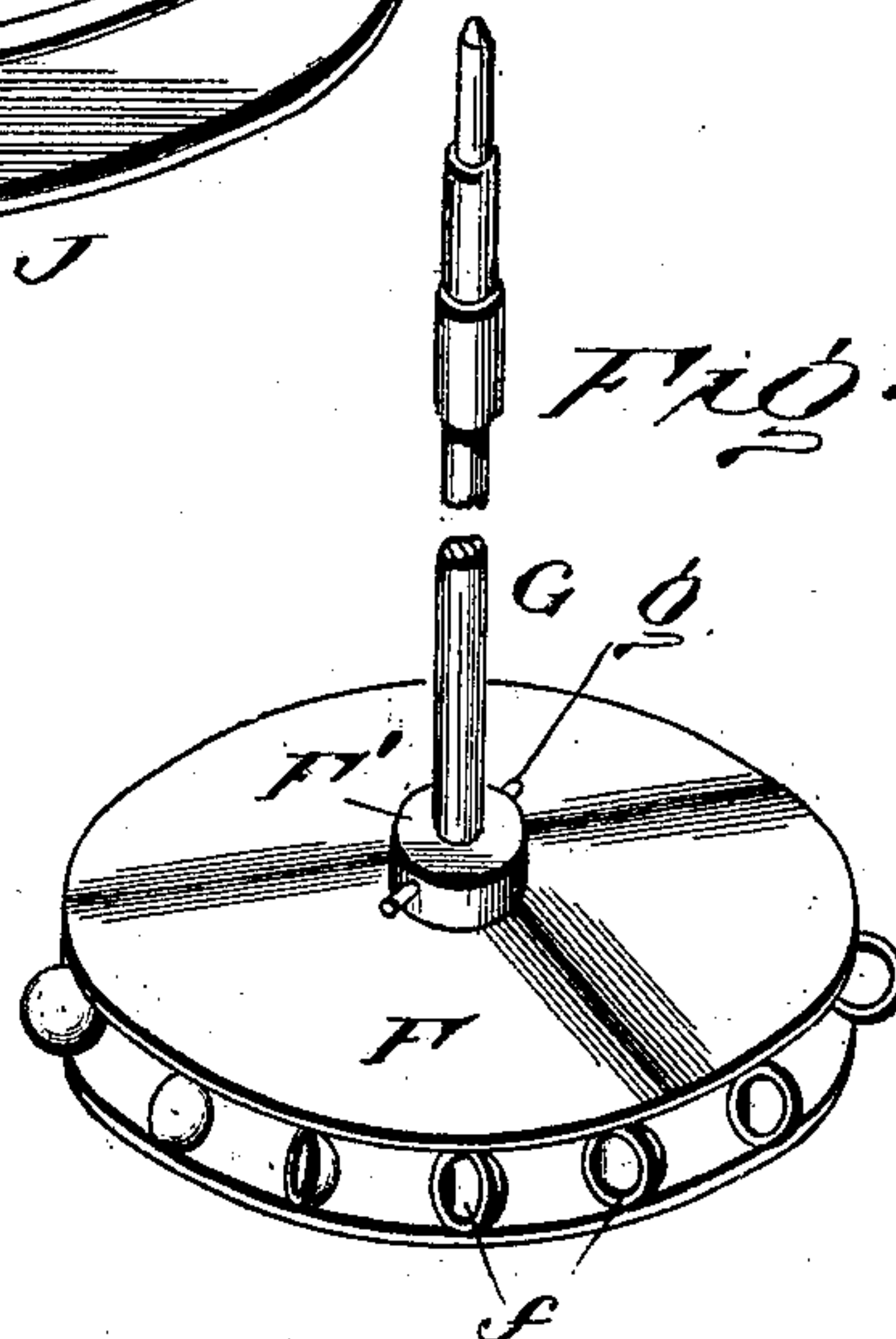
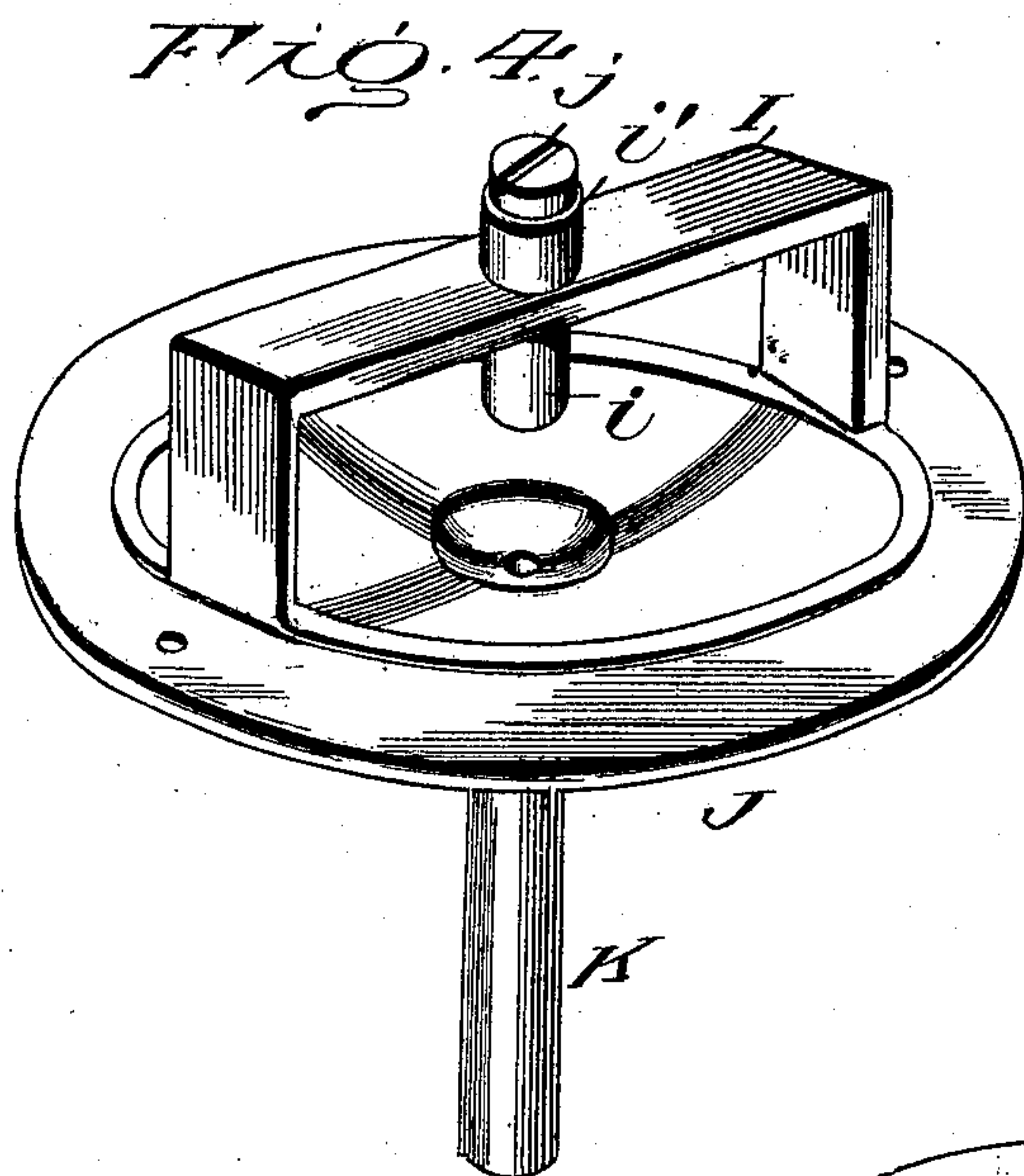
Patented Sept. 17, 1901.

W. & J. BOEKEL.
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2 Sheets—Sheet 2.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM BOEKEL AND JULIUS BOEKEL, OF PHILADELPHIA,
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IMPACT WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 682,664, dated September 17, 1901.

Application filed May 15, 1901. Serial No. 60,350. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BOEKEL and JULIUS BOEKEL, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have
5 invented certain new and useful Improvements in Impact Water-Motors; and we do hereby declare the following to be a full, clear, and exact description of the invention,
10 such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to impact water-motors the casings of which are made up of separable sections; and it consists in the construction and combination of parts herein-
15 after more particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a vertical central section through a motor embodying our invention. Fig. 2
20 represents a perspective view taken from above from the bottom section of the casing detached. Fig. 3 represents a similar view of the middle section of the casing. Fig. 4 represents a similar view taken from below
25 of the top casing of the section. Fig. 5 represents a horizontal section through the motor on the line of the semicircular waterway and its jet-holes. Fig. 6 represents a detail view of the wheel and its spindle.

30 A designates the annular section of the casing, having cast with its inner surface a semicircular waterway C, which receives water from the outside of the casing through an inlet D, protruding tangentially therefrom and
35 externally screw-threaded to receive a coupling E, whereby the end or nozzle *e* of a pipe or hose (indicated by dotted lines) is attached. The said waterway is provided with a jet-hole *d* in line with the bore of said inlet; also,
40 with another jet-hole *c*, diametrically opposite thereto, the water issuing from these jet-holes being directed against and into concave peripheral cups or buckets *f* of a wheel F, which carries a spindle G, said wheel and
45 spindle being connected by a pin *g*, which passes through a hole in the upwardly-projecting hub F' of the said wheel and into a recess of the said spindle. The said spindle may carry tubes or vessels arranged to be
50 tested by centrifugal action or any other convenient devices. The said wheel is supported

by a bearing-sleeve *i*, raised on the top of a broad flat U-shaped bridge I, which is cast or otherwise made rigid and practically integral with the cover J of the casing. The
55 spindle aforesaid is stepped into this bearing-sleeve, a downward extension *i'* of which is provided below the said bridge with internal screw-threads receiving a small screw-plug *j*, which confines lubricating material within the
60 bore of said sleeve, but allows at will access to said bore and the lower end of said spindle. A long guide-sleeve K is raised centrally on the said top J, being connected detachably
65 thereto by internal screw-threads on the lower end of said sleeve engaging a screw-threaded stud, the said sleeve serving to guide, brace, and protect the spindle aforesaid. The construction of these parts at the upper end of
70 the motor has the advantage of keeping the bearings of the wheel and spindle all together in the top plate J and bridge I, which are actually or practically one piece. There is consequently no risk of the bearings getting out
75 of line, so as to cause wear and strain, nor any need of special care or expedients to avoid such a defect. Moreover, the wheel and spindle and all proximate parts are very easily removable as one piece to allow inspection,
80 cleaning, and repair.

The cover J is fastened to the middle section A by screws L, which pass through holes in said cover into screw-tapped internal lugs or blocks L' inside of section A and cast there-
85 with.

The bottom section M of the motor is provided with legs or supports *m* and with an outlet O in the form of a trough extending
90 radially from its center and discharging at its side through a short tubular neck O', to which a pipe may be attached. An outlet at the bottom of a motor tends to create a vortex which would prevent the free escape of water and impede more or less the action of
95 the wheel. To guard against this, we provide two raised flanges P and Q, extending each half-way the top of said bottom section M, so as to leave the central part of said plate, including the beginning of the said outlet, between them. The top of said section or plate
100 M is concave, the center being its lowest point. The water descending from the wheel

is prevented by these flanges from making the circuit of the said plate and is directed straight into the said outlet without forming a vortex.

5 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an impact water-motor, the combination of a water-wheel and its spindle with the
10 top section of the casing by which they are carried and with which they are removable, the middle section of the casing being provided with a waterway and nozzles for impact jets and the bottom section with an outlet substantially as set forth.

15 2. In an impact water-motor the combination of a water-wheel and its spindle with a casing in three detachable sections, the top section being provided with bearings for the
20 said spindle and wheel which are removable with it, the bottom section being provided

with an outlet and the middle section being provided with a waterway which discharges through nozzles against the periphery of said wheel, substantially as set forth.

25 3. In a water-motor a casing having a bottom section or plate which is concave on top to a central opening discharging out through its side, the said plate or section being also provided with two raised flanges which extend inwardly from opposite sides of the said
30 plate on parallel lines, leaving the beginning of the outlet between their inner ends and serving to prevent a vortex substantially as set forth.

35 In testimony whereof we affix our signatures in presence of two witnesses.

WM. BOEKEL.

JULIUS BOEKEL.

Witnesses:

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