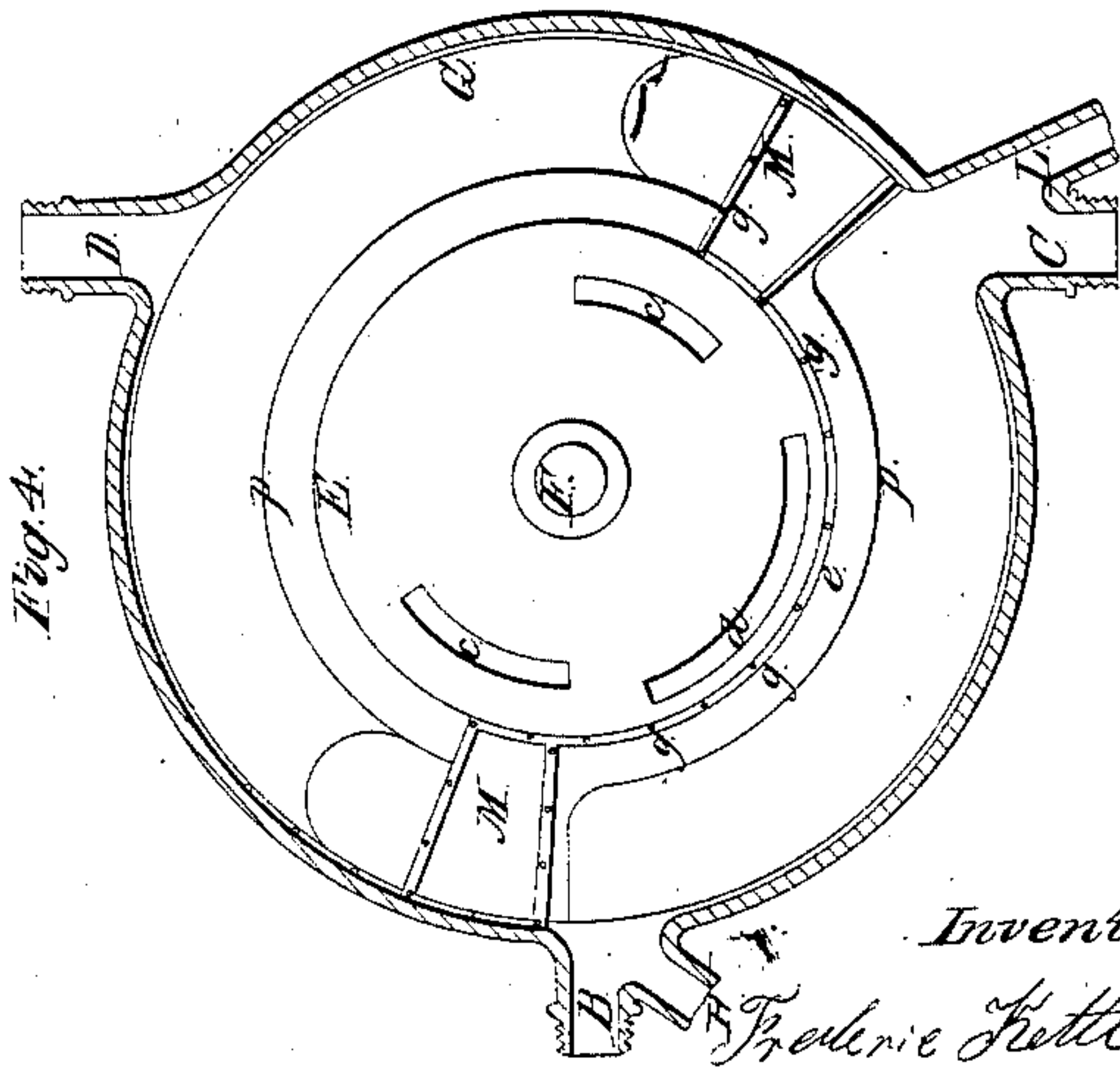
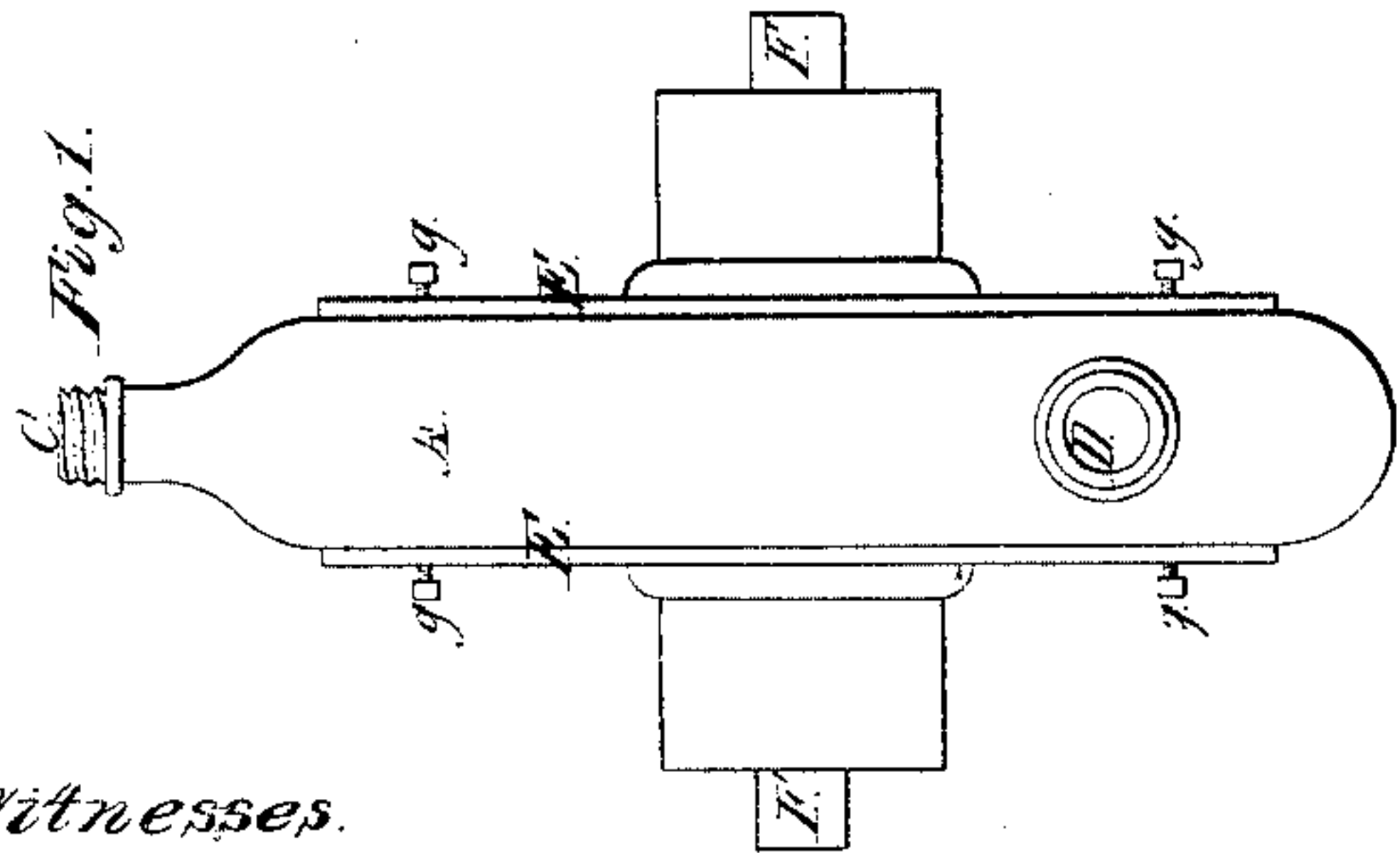
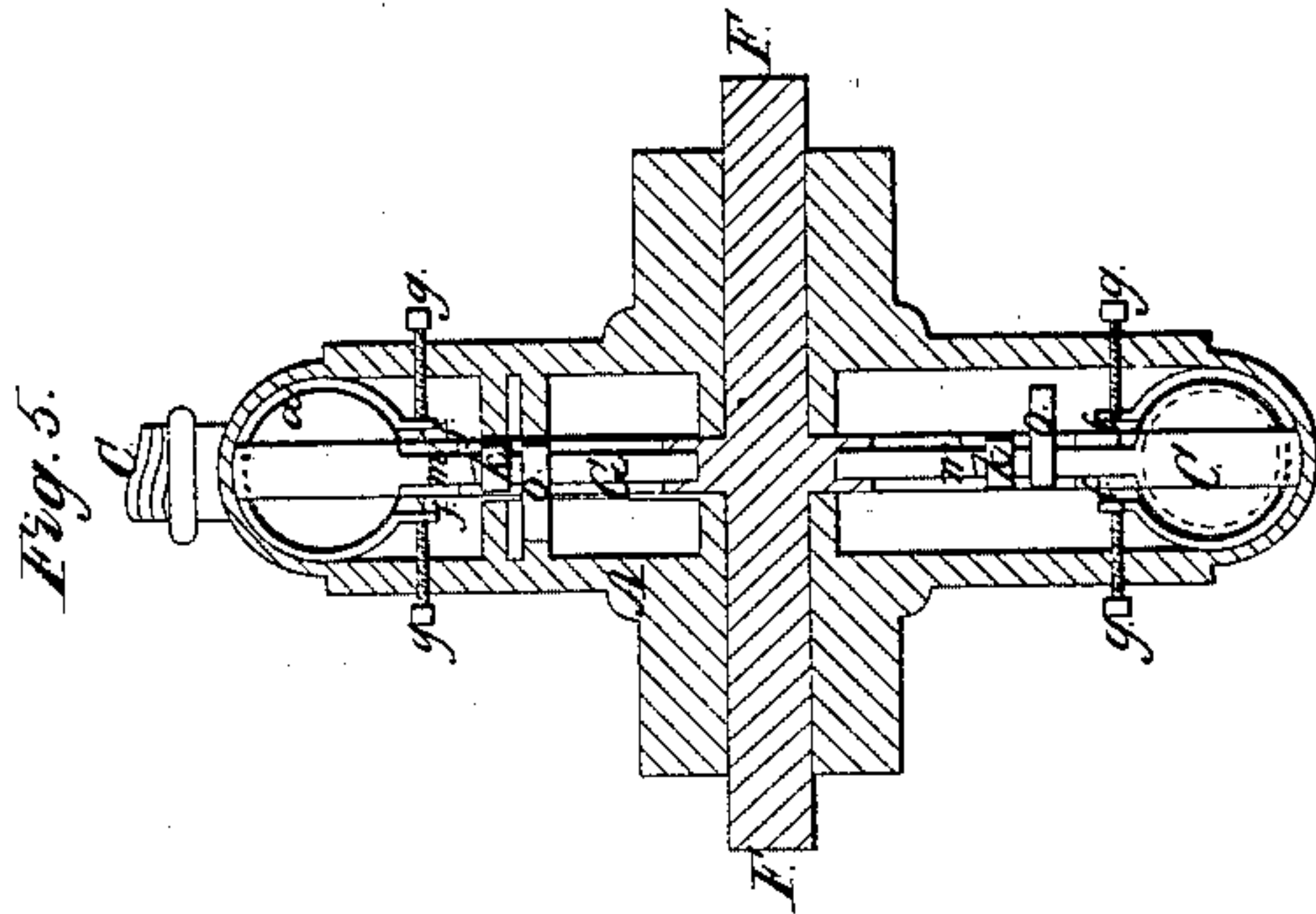
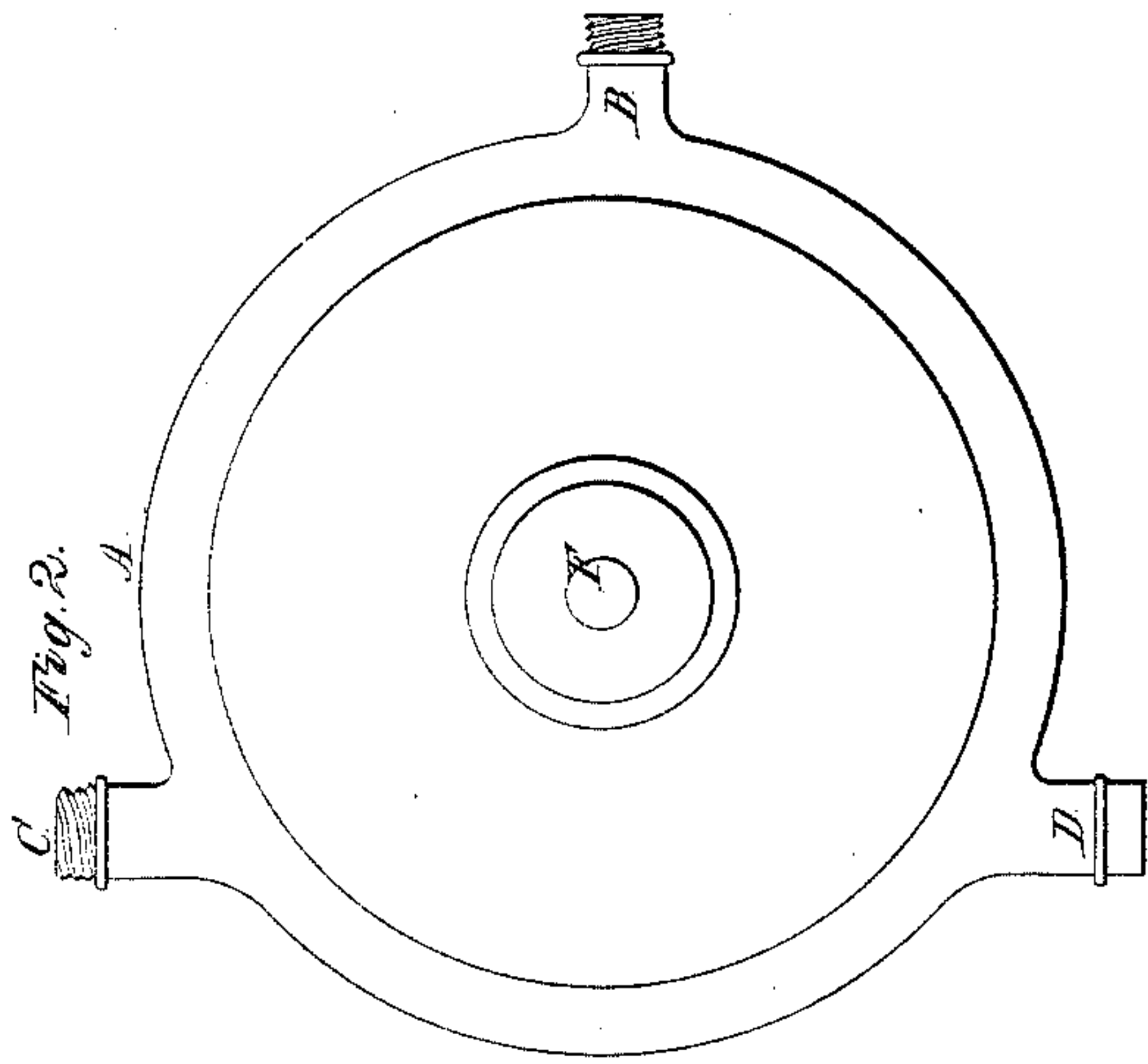
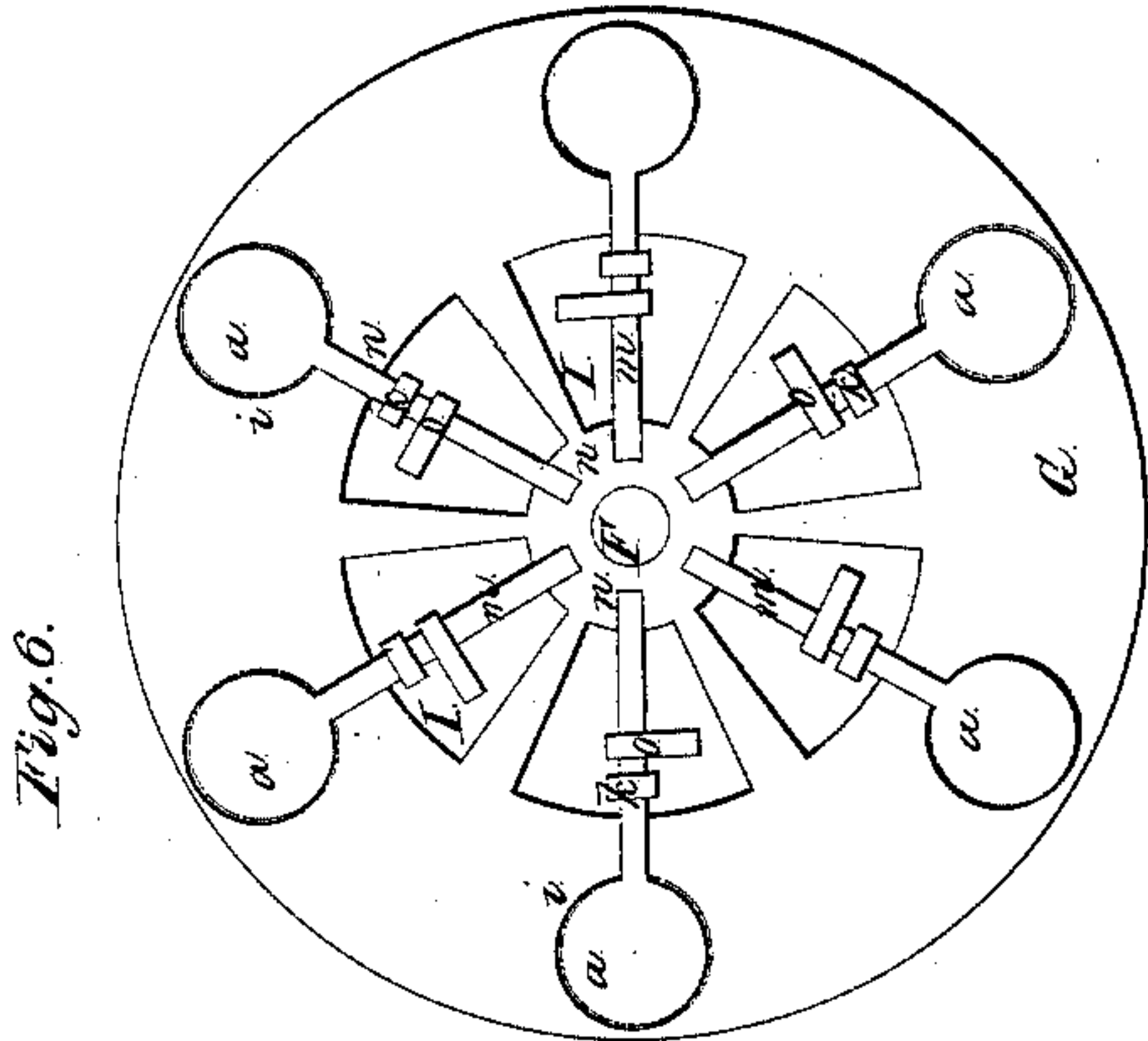
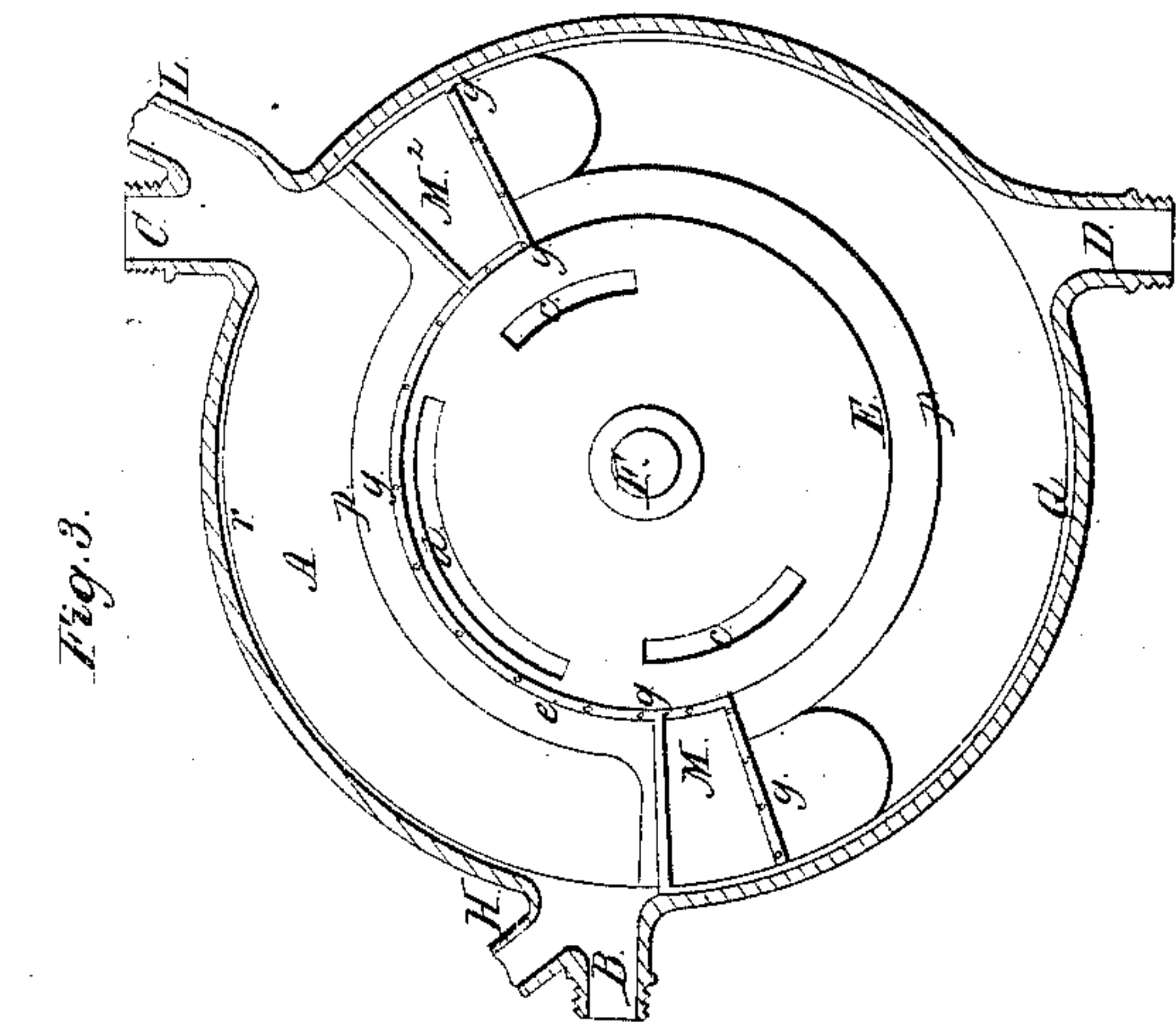


F. Kettler

Rotary Steam Engine.

N^o 30,481.

Patented Oct. 23, 1860.



Witnesses.

Wm. H. Thompson
Chas. H. Anderson

Inventor.

Frederic Kettler

UNITED STATES PATENT OFFICE.

FREDERIC KETTLER, OF MILWAUKEE, WISCONSIN.

ROTARY ENGINE.

Specification of Letters Patent No. 30,481, dated October 23, 1860.

To all whom it may concern:

Be it known that I, FREDERIC KETTLER, of Milwaukee, in the county of Milwaukee, in the State of Wisconsin, have invented a new and Improved Rotary Engine; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in a stationary cylinder (which has the form of a circular ring) and a revolving disk with inserted pistons; the latter working as throttle-valves in the inner periphery of the cylinder during the rotary motion of the disk; also a machinery to regulate the alternate motion of the rotary engine.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Figure 1 represents an exterior elevation of the whole apparatus; Fig. 2 is a side view; Figs. 3 and 4 are interior elevations; Fig. 5 is a sectional part of the whole, and Fig. 6 is an elevation of the disk.

Similar letters refer to like parts.

A is the cylinder or a round hollow ring. It is cast in two pieces and bored perfectly true; below M and M² this cylinder is furnished with flanges for the purpose of rectifying and repairing the internal structure. The cylinder A is grooved innerly at *r* and open at *p* to receive the disk G.

B and C are the steam ports and D, H and L the discharge ports of the cylinder A.

G is the disk which is firmly attached on a horizontal shaft F. The disk G is constructed in such a manner so as to work freely in the groove *r* and opening *p* of the cylinder A.

i and I are holes in the disk G in which the pistons *a* with their respective shafts *m* and studs *o* and *k* are working. The pistons *a* are constructed round and flat, and of the same thickness of the disk G; they work like throttle valves. The number of pistons is here six. Said number may be larger or smaller according to the power required. Said pistons *a* are provided with a ring packing and springs so as to fit and work air tight in the cylinder A. The disk G is provided on both sides with a sharp ring *f*, as is shown in Fig. 5.

F is the mainshaft of the engine.

The studs *o* and *k* and pistons *a* are firmly

attached to the shafts *m*. The studs *o* are situated in the same plane with the pistons *a*, and the studs *k* form a right angle with them. The shafts *m* radiate from the center of the disk G and works freely in the corresponding holes or boxes at *n*. The shafts *m* run lengthwise through the center of the pistons *a* and are firmly attached to them.

E and E are the covers with borders *e* on it. The covers E and E are provided with packing and fastened by means of screws *g* to the cylinder A, so that the cylinder A will be perfectly airtight. Their borders *e* will be pressed airtight to the sharp disk rings *f*. The disk rings *f* are constructed sharp so as to cause less friction. In the center of the covers E and E are holes to allow the main shaft F to pass freely through. The covers E, E are provided with abutments *c*, *d* to work the pistons *a*.

The steamports B and C and discharge ports D, H and L are provided with cocks to regulate the alternate motion of the engine. If the cocks at B and L are open the machine will work from the left to the right and when shut the cocks C, H have to be opened, then the machine will work the other way. The discharge port D remains always open for the discharge of the condensing water.

M and M² are a pair of packing boxes, they are fastened exactly opposite each other on the right and left into the cylinder A, and constructed in such a way so as to allow the disk to work airtight between them.

Suppose now that steam was admitted at the steamport B and that two of the pistons *a* are ready to receive the pressure of steam, that is to say that they will form right angles with the disk G; said pistons will be forced by the steam around the inner periphery of the cylinder A and communicate a rotary motion to the disk G and main shaft F. As soon as now the pistons revolve around the inner periphery of the cylinder A, the studs *o* will come in contact with the abutments *c* and shut off the communication of steam from the pistons *a*. In this case the piston will lie in the same plane with the disk G, and the used steam will have an opportunity to escape at L or D. By further operating the machine, the studs *k* will come in contact with the abutments *d* and will cause to open the valves *a*, so that the steam can act again with its full pressure on said valves or pistons *a*.

It is obvious that the pistons *a* will work only in the upper part of the cylinder A between the packing boxes M and M². The lower part of the cylinder serves only to
5 keep the pistons warm. The whole of the cylinder is supported by a frame. The shaft is here represented to work horizontally but it may work as well vertically by turning the cylinder A the other way.

What I claim as my invention and desire 10 to secure by Letters Patent is—

A rotary engine, constructed and operating substantially as herein described.

FREDERIC KETTLER.

Witnesses:

W. MERTZ,
JOHNSTON MARSTEAD.