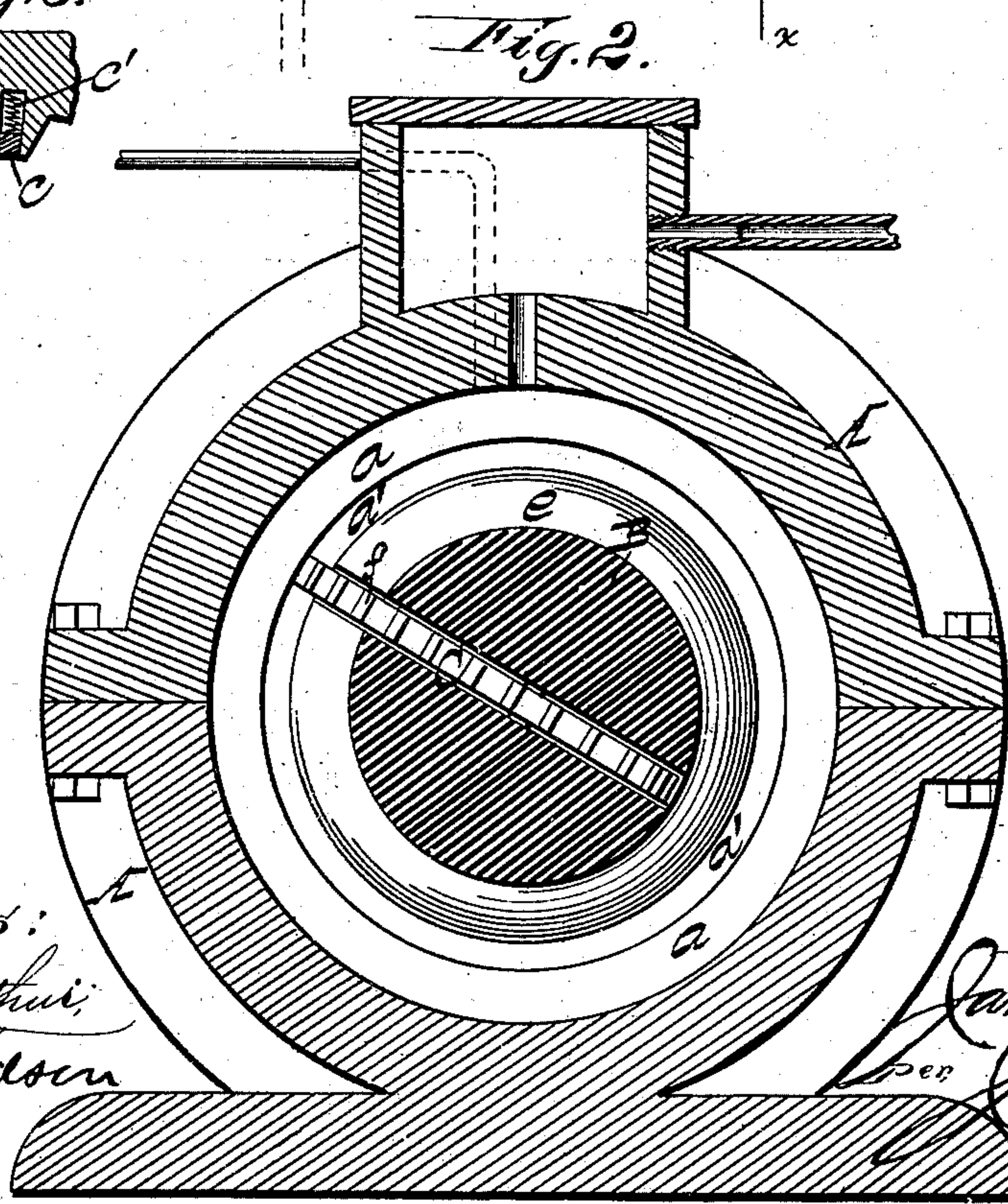
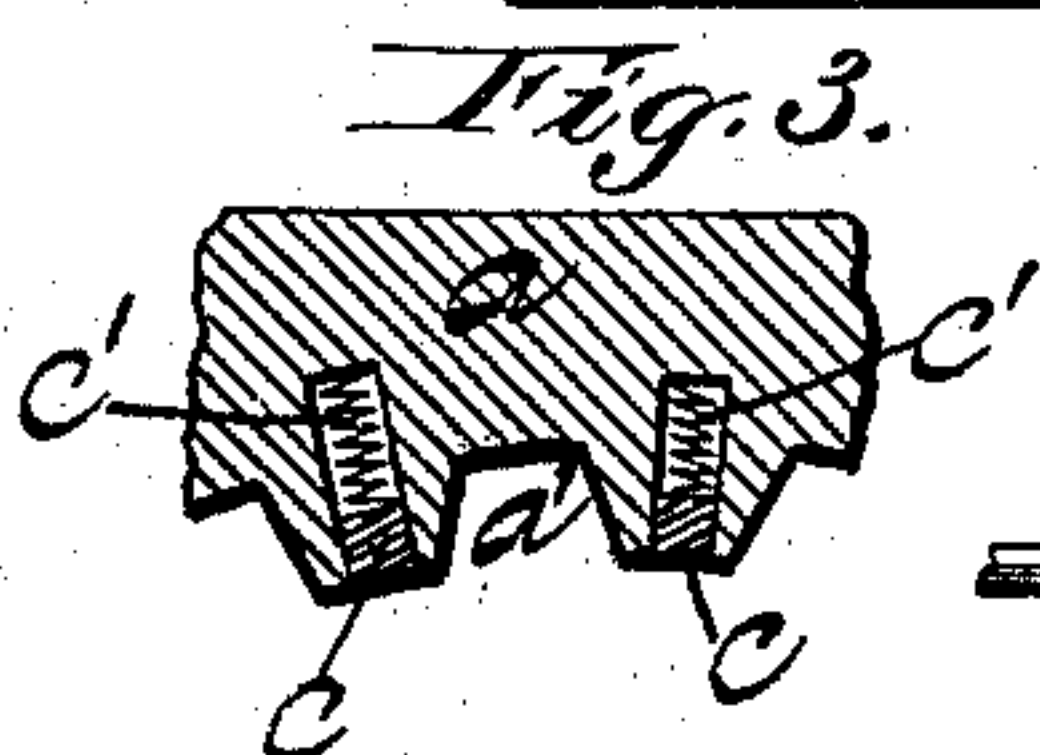
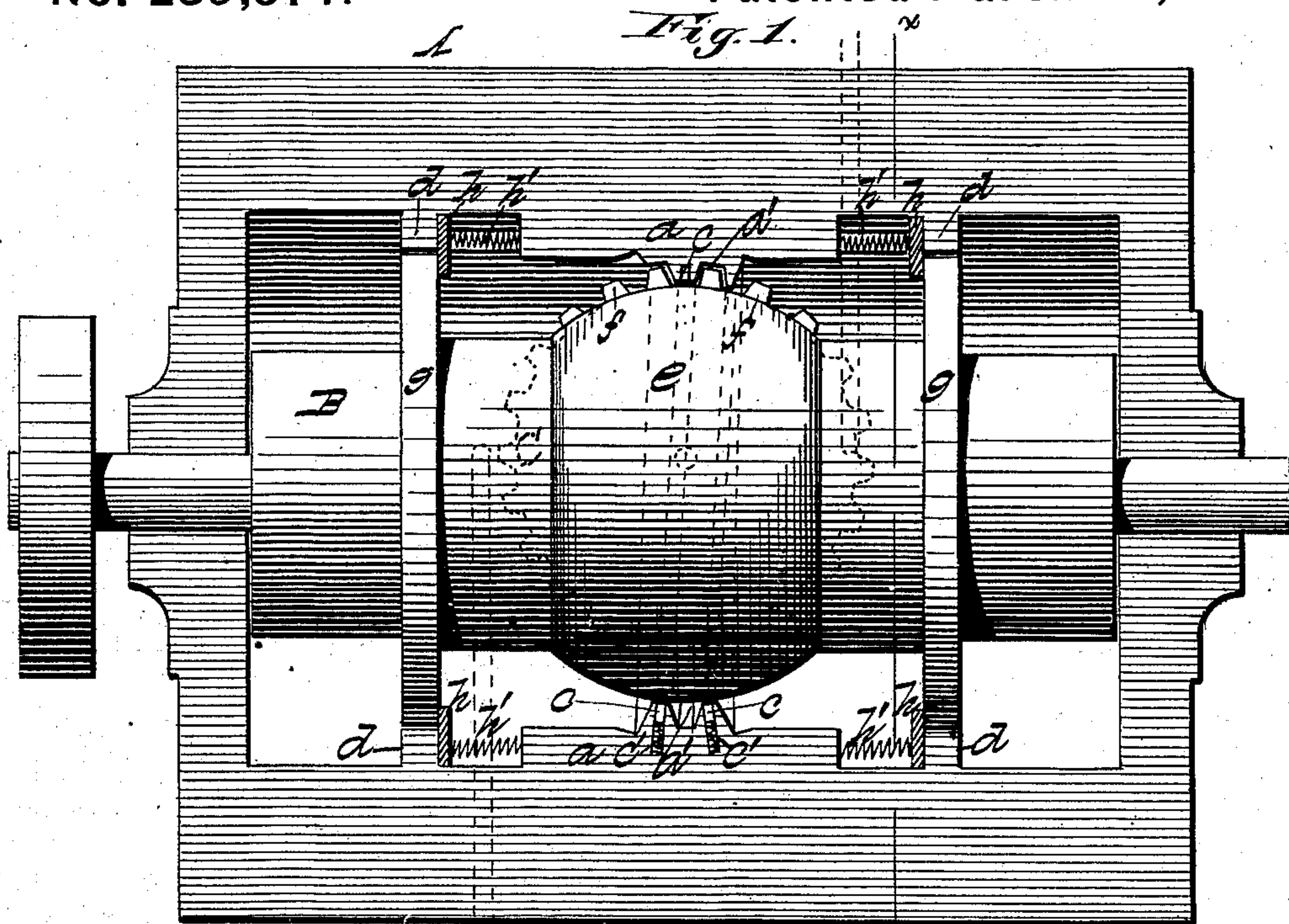


(Model.)

J. TORRENCE.  
Rotary Engine.

No. 239,574.

Patented March 29, 1881.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES TORRENCE, OF CLARION COUNTY, PENNSYLVANIA.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 239,574, dated March 29, 1881.

Application filed August 5, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, JAMES TORRENCE, of the county of Clarion and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, sufficient to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and in which—

Figure 1 is a plan view of my improved engine, with the upper half of the cylinder removed. Fig. 2 is a vertical transverse section thereof on line *xx* of Fig. 1; and Fig. 3 is a detailed sectional view, showing the parts enlarged, with packing to produce steam-tight joint where the piston-cylinder divides the steam-cylinder into two chambers or compartments.

This invention appertains to improvements in that class of rotary engines having a cylinder provided with a revolving cogged or toothed wheel which engages with spiral grooves in the steam-cylinder; and it consists of a piston-cylinder with its central portion, within which is hung its revolving toothed or cogged wheel, provided with a circumferential bulge or enlargement adapted, with packing, to divide the steam-cylinder having the spiral grooves into two chambers—a steam-supply and an exhaust chamber.

It consists, further, in providing the piston-cylinder, at equal distances from its center, with circumferential flanges or rings, opposite which are arranged, upon the interior of the steam-cylinder, similar flanges or rings, the joints between which are fitted with steam-tight packing, substantially as hereinafter more fully set forth.

Referring to the accompanying drawings, A indicates the steam-cylinder, which, as is usual, is constructed in two parts or halves, suitably bolted together. To the inner circumference of the cylinder A, about midway its length, is supplied an elevation, *a*, having the spiral grooves *a' a'*. In the faces of the walls of the grooves are inserted packing *c*, seated or cushioned in slots in said walls upon springs *c'*, which take up the wear of the packing. The

inner circumference of this cylinder is further provided or cast with rings or flanges *d d* at equal distances from its center, the function of which will appear hereinafter.

B refers to the piston-cylinder, with its shaft bearing in the ends or heads of the steam-cylinder A, one end of the shaft having a pulley, over or around which may be passed a belt for transmitting motion to the machinery to be operated. The piston-cylinder B is provided at its central portion with a bulge or enlargement, *e*, which, it will be observed, is adapted to meet the steam-tight-packed faces of the walls of the grooves *a' a'* of the steam-cylinder A, and thus enable the piston-cylinder itself to divide the steam-cylinder into two chambers—a steam-supply chamber and an exhaust-chamber.

Within a slot in the bulged portion of the piston-cylinder is pivoted or hung, at its center, the steam-wheel C, having peripheral cogs or pistons *f f*, a number of which project beyond the bulge or enlargement *e* of the cylinder B, as seen in Figs. 1 and 2, to receive consecutively the action of the steam thereon.

Upon the periphery or circumference of the piston-cylinder B are preferably cast, at equal distances from the center of its circumference, two rings or flanges, *g g*, coinciding with the flanges or rings *d d* of the steam-cylinder. The joints between these flanges *g d* are packed steam-tight by the packing *h*, acted upon by the compensating-springs *h'*, taking up wear of the packing.

It will be noticed that while these rings, the area of which pressed by the steam is equal to the surface of the bulging portion of the piston-cylinder pressed by the steam, prevent endwise movement of the piston, as would occur in the absence of the rings, they also, with the coincident rings on the outer cylinder, afford a convenient and more effectual method of packing the piston-cylinder steam-tight than could be obtained by arranging the packing at the ends of the said cylinder.

The steam supply and exhaust pipes are indicated in full and dotted lines in the two main figures. As before intimated, the steam is fed into one of the chambers into which the steam-cylinder is divided by the piston-cylinder, when its pressure will act upon the ex-

posed teeth of the wheel in the piston-cylinder consecutively and revolve, by the passage of the teeth in the grooves of the steam-cylinder, the piston-cylinder, from which the motion  
5 can be transmitted to machinery in the manner previously described, or in any other well-known way.

It is obvious that this engine can be adapted to drive or operate, among other machinery,  
10 various kinds of pumps capable of receiving rotary motion.

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

15 1. In a rotary engine, the combination, with the steam-cylinder A, having the steam-tight-packed spiral grooves *a'*, of the piston-cylinder B, carrying the cogged or toothed wheel

C, and having the central peripheral enlargement or bulge *e*, meeting the packed faces of  
20 the walls of the grooves *a'* of the cylinder B, substantially as and for the purpose set forth.

2. In a rotary engine, the combination, with the steam-cylinder A, having the spiral grooves  
25 *a'*, with the faces of their walls packed steam-tight, and the rings or flanges *d d*, with steam-tight packing, of the piston-cylinder B, having the toothed or cogged wheel C, the central peripheral bulge or enlargement, *e*, meeting  
30 the packed faces of the walls of the grooves *a'*, and the peripheral flanges or rings *g g*, substantially as and for the purpose set forth.

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Witnesses:

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