

(No Model.)

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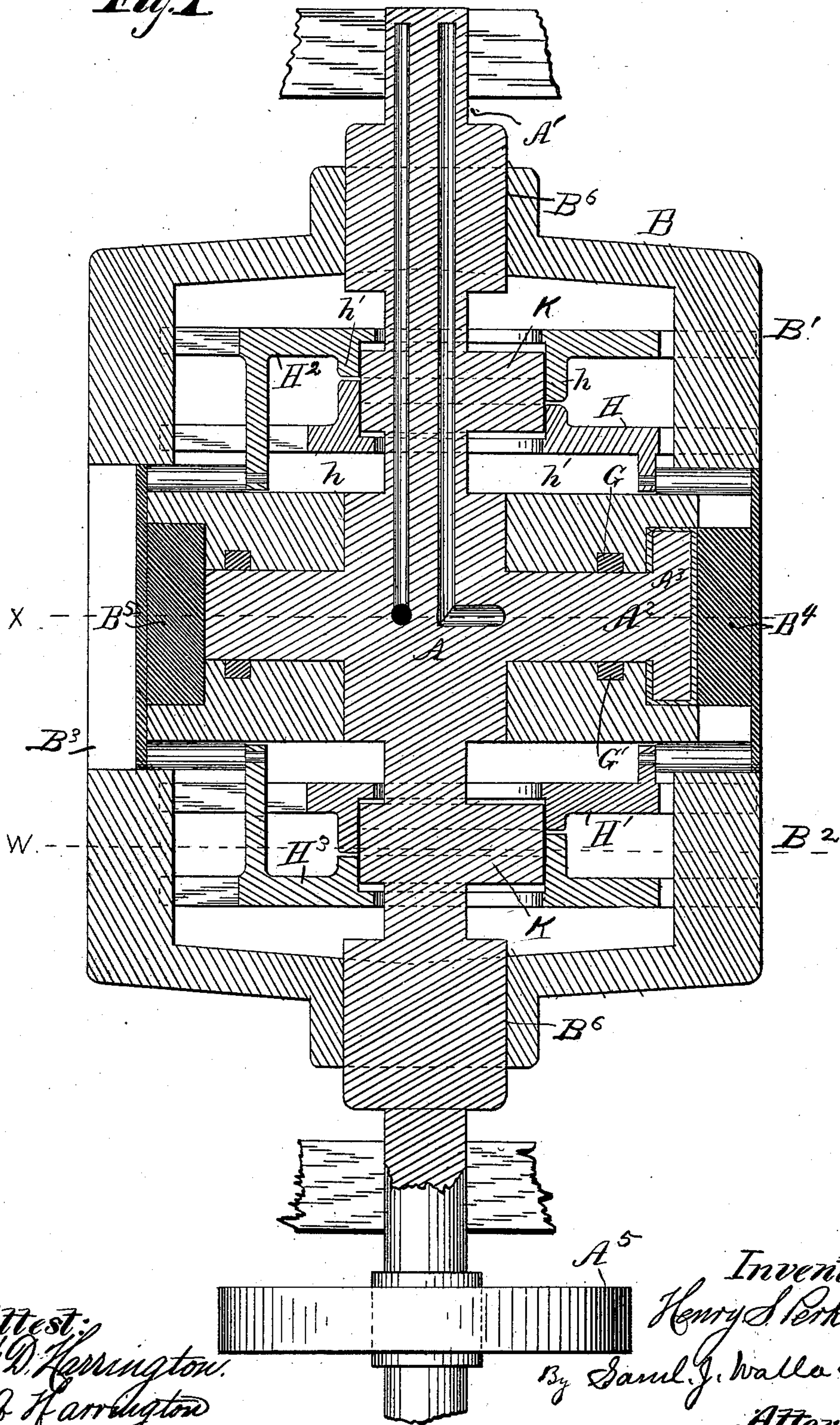
H. S. PERKINS.

ROTARY ENGINE.

No. 361,447.

Patented Apr. 19, 1887.

Fig. 1



Attest:
W. D. Harrington.
C. A. Harrington

Inventor.
Henry S. Perkins.
By Samuel J. Wallace,
Attorney.

(No Model.)

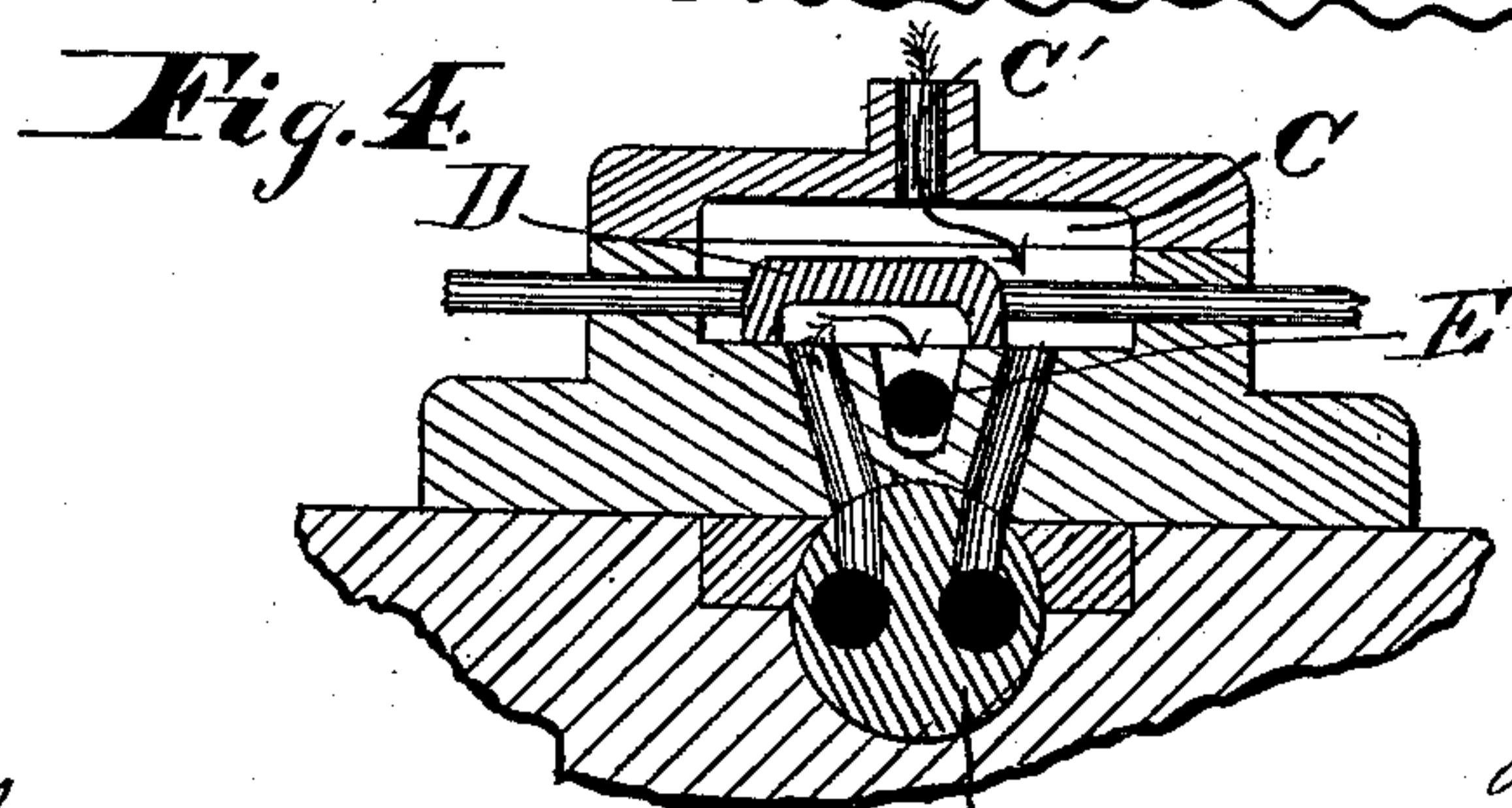
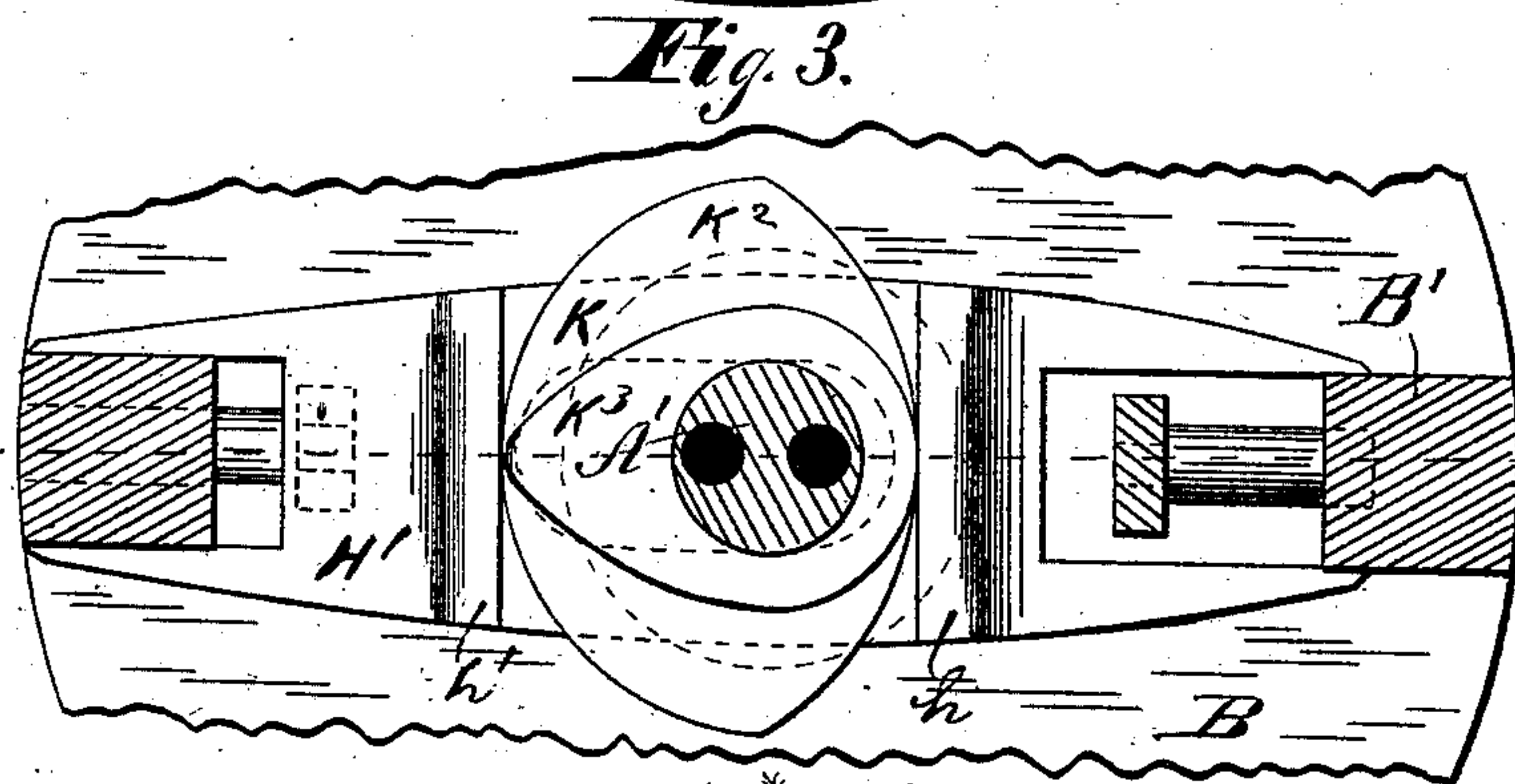
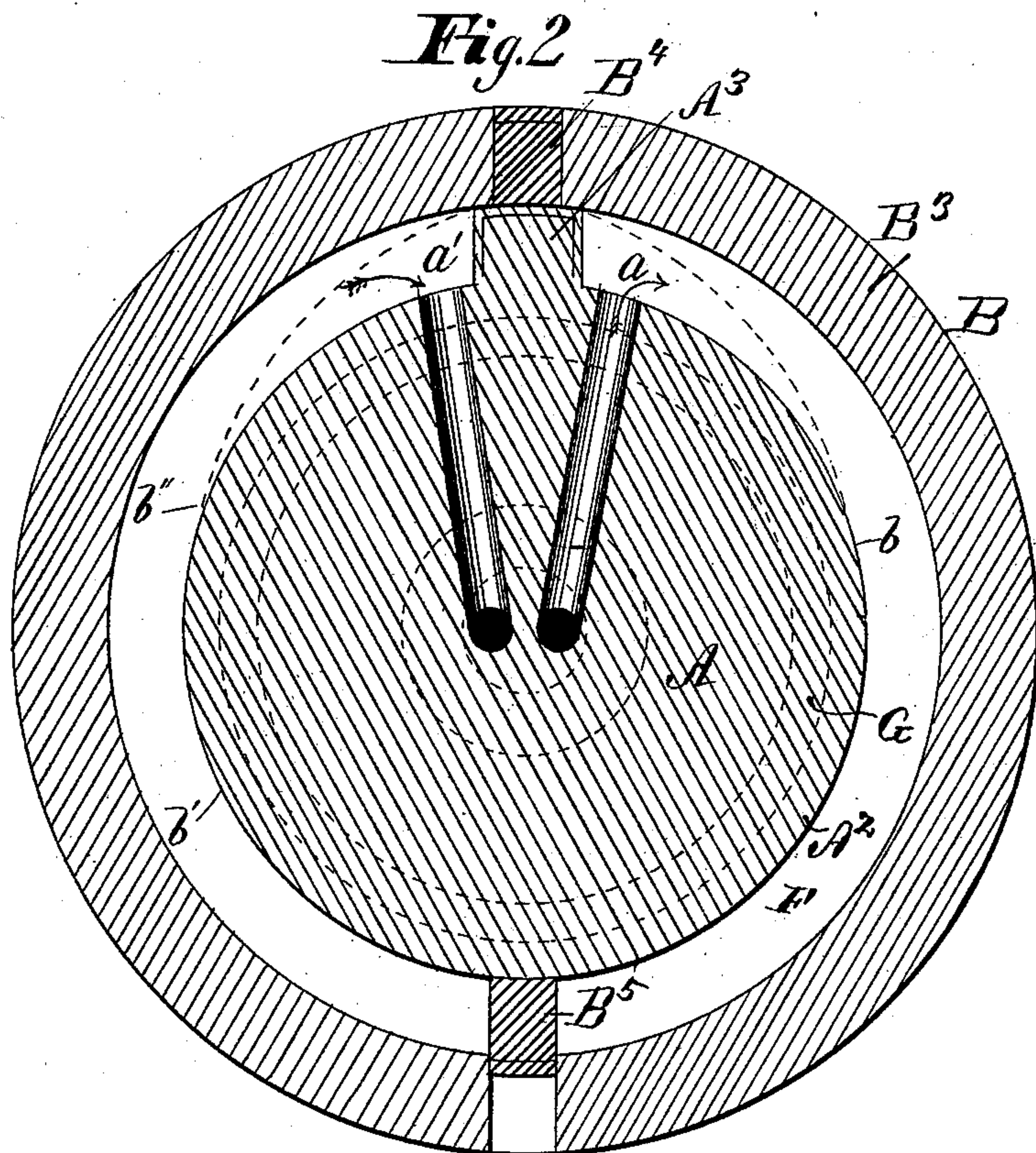
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S. A. Harrington.

Inventor:
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By Samuel J. Wallace,
Attorney.

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Fig. 5. A A^2 G' H^4

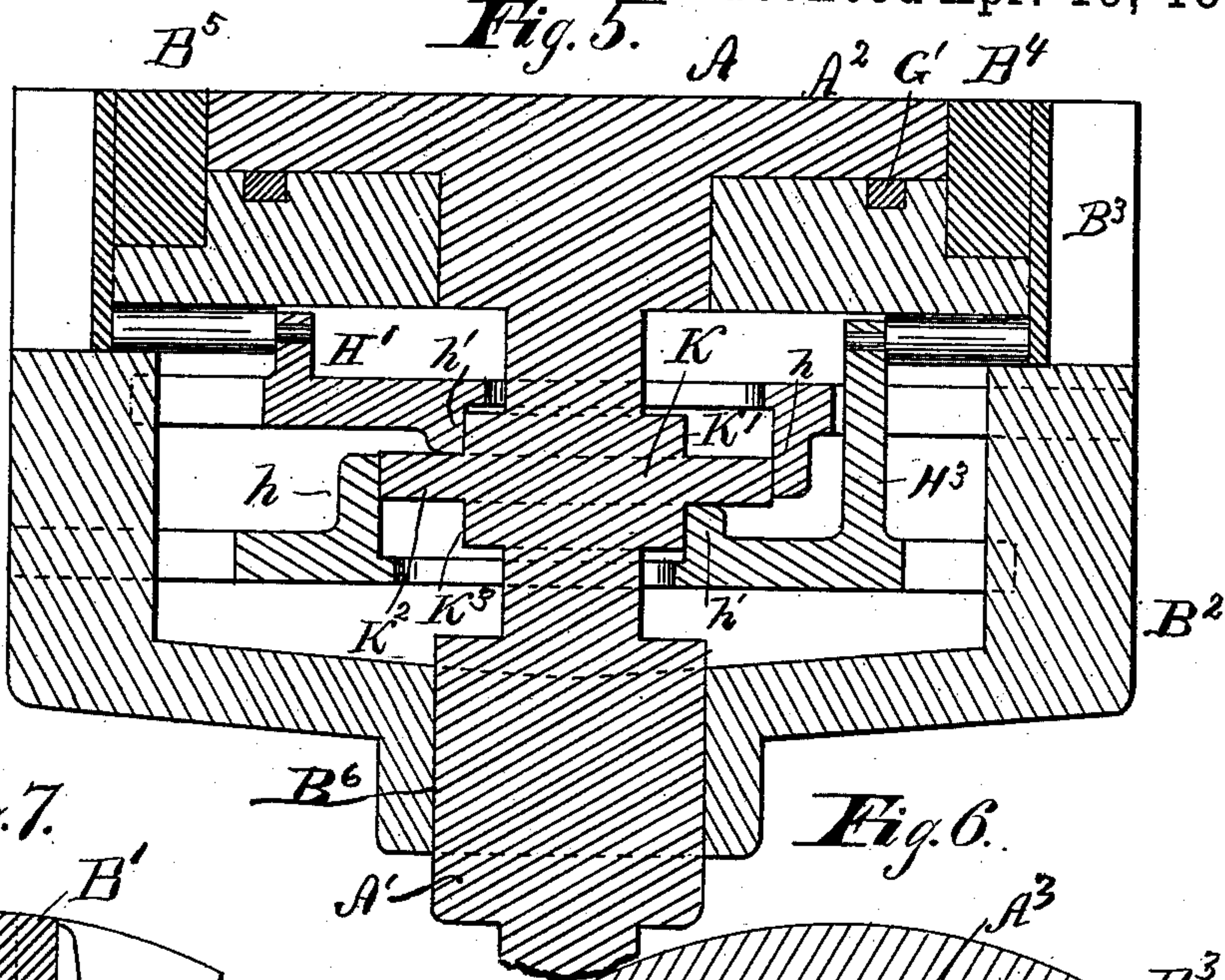


Fig. 7.

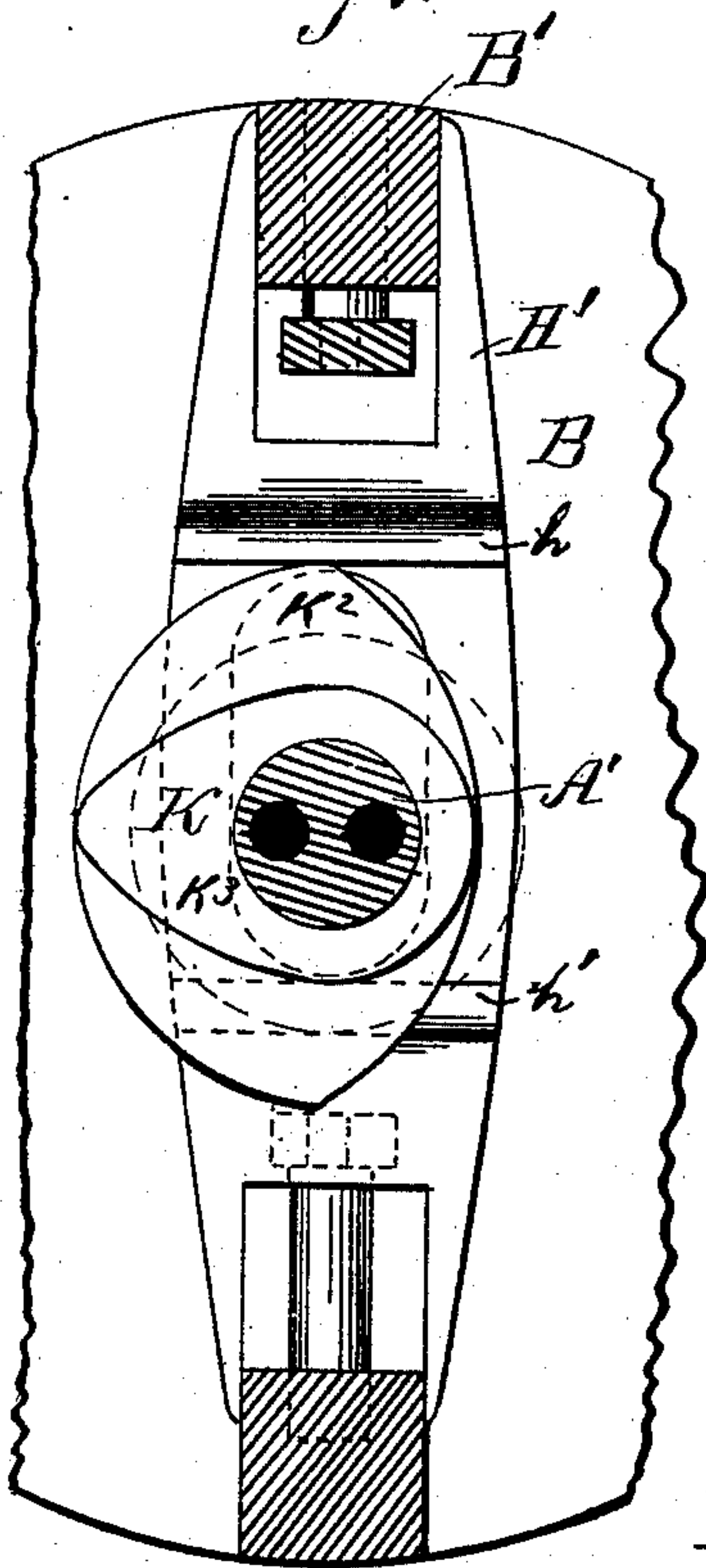


Fig. 6.

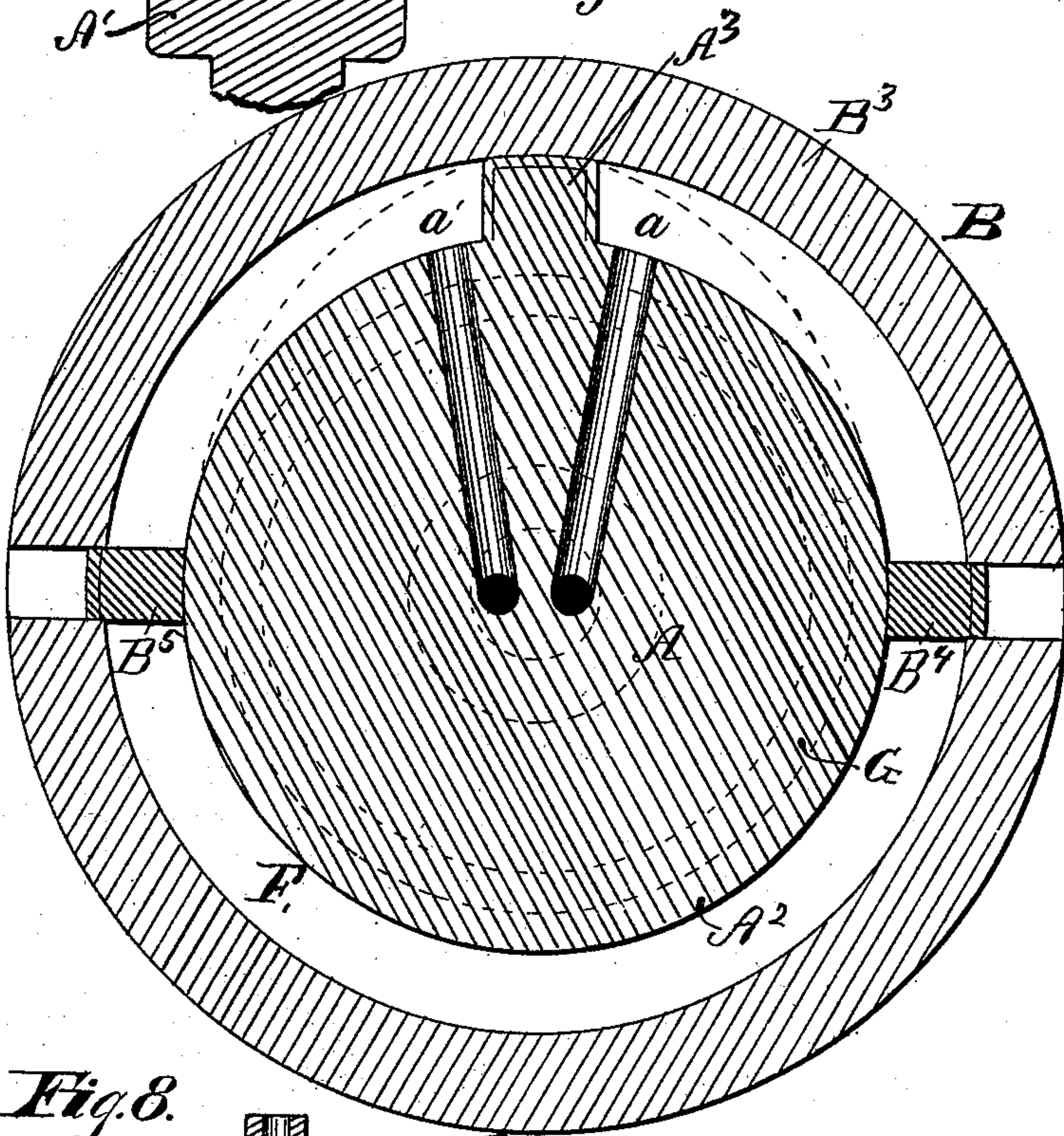
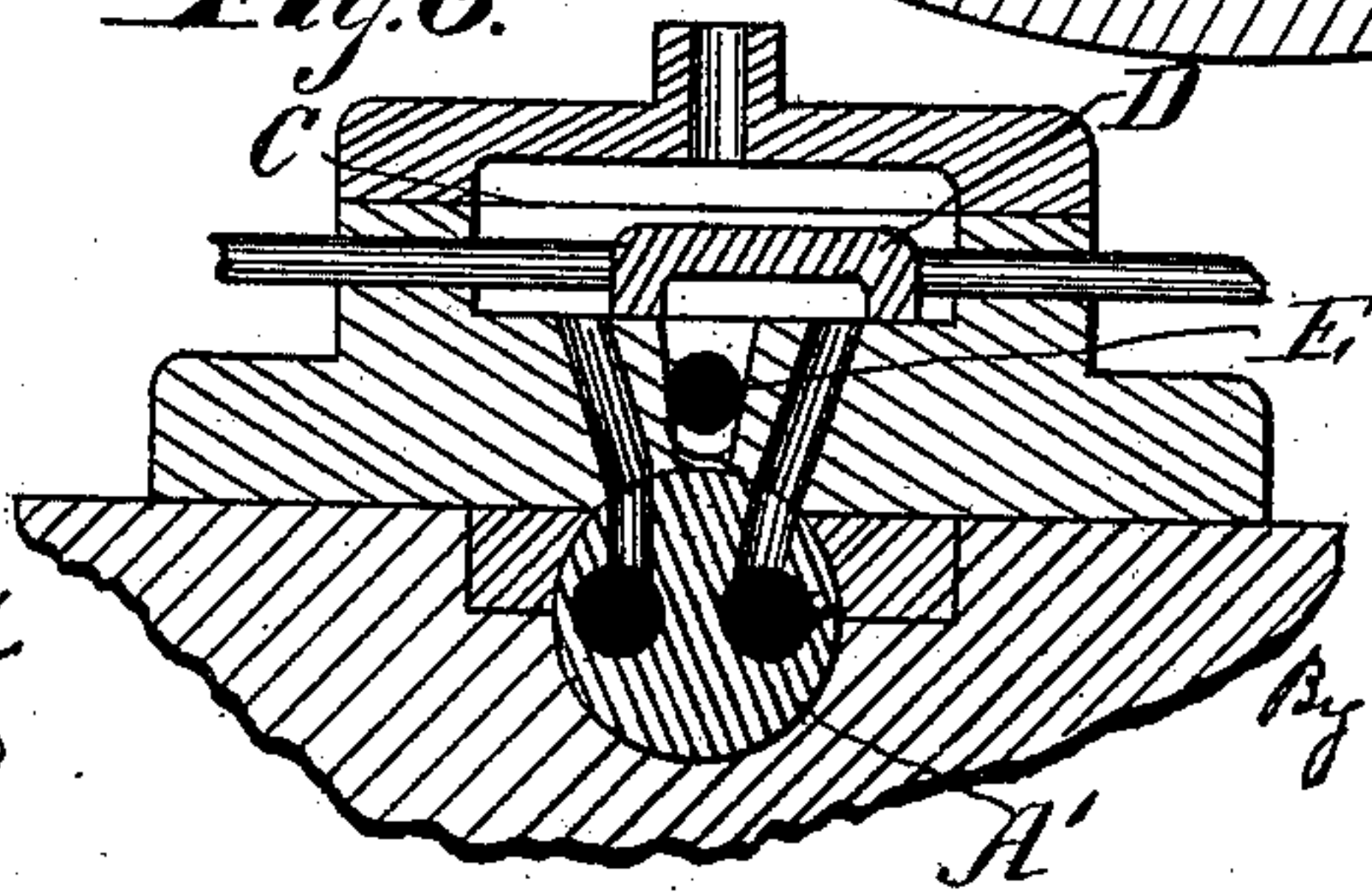


Fig. 8.



Attest:
H. D. Harrington
& Co. Harrington

Inventor:
Henry S. Perkins,
By Samuel J. Wallace,
Attorney.

(No Model.)

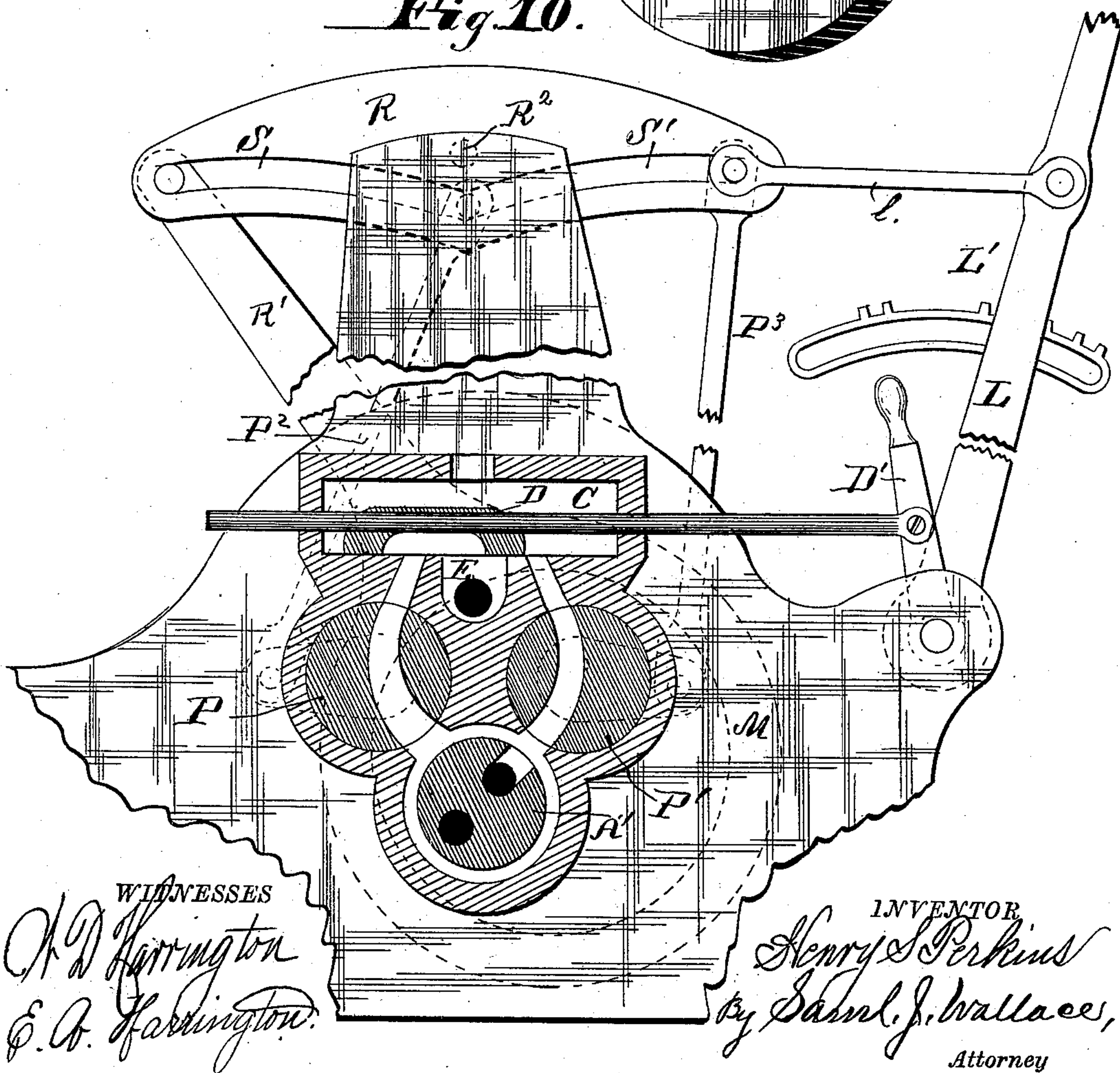
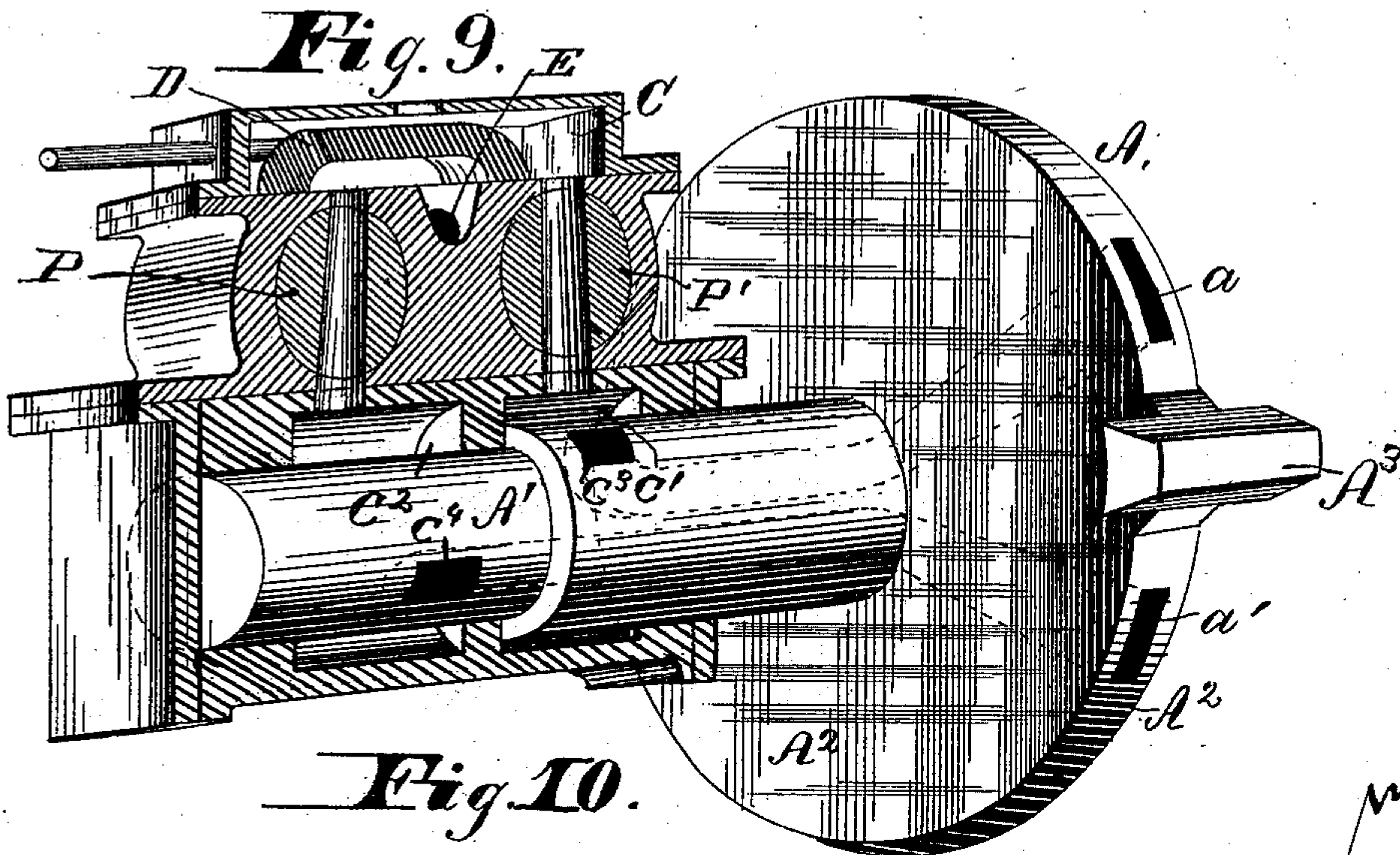
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WITNESSES

H. D. Harrington
E. A. Harrington.

INVENTOR

Henry S. Perkins
by Saml. J. Wallace,
Attorney

UNITED STATES PATENT OFFICE.

HENRY S. PERKINS, OF DUNHAM, ALABAMA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 361,447, dated April 19, 1887.

Application filed July 21, 1886. Serial No. 208,653. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. PERKINS, of Dunham, in the county of Butler and State of Alabama, a citizen of the United States, have
5 invented a new and useful Improvement in Rotary Engines and Valve-Gears, which is made, practiced, and used substantially as set forth hereinafter, and as shown in the accompanying drawings, in which--

10 Figure 1 is a horizontal section of the engine. Fig. 2 is a central cross-section of same. Fig. 3 is a like section on line W of same. Fig. 5 is a section of a part similar to Fig. 1 after a quarter-revolution from the positions
15 therein. Figs. 6 and 7 are sections similar to Figs. 2 and 3, in like way. Figs. 4, 8, 9, and 10 illustrate the steam passages and valves, the upper part of Fig. 9 being turned partly around from right relations as shown in Fig. 10.

20 This invention consists in an improved rotary engine and in several improved features therein, as set forth hereinafter, and as shown in the drawings.

This improved engine has two parts, A B, each of which can be alternatively rotated by the steam, acting the same way in each case, while the other is held stationary. The part A is mounted in bearings at the ends, and bears part B, mounted with bearings B⁶ upon it.
30 When part A turns, power is taken from it by belt on drum A⁵, and when part B turns power is taken by a belt on its periphery. Part A consists of a shaft, A', and a disk portion, A². Disk A² bears a head, A³, which fits closely
35 and turns freely in steam-chamber F as a piston when part A turns, and acts in the same way as a stationary abutment for the steam when part B turns. This head A³ has spring-packing on its faces against the walls of chamber F. Part A has passages through its disk
40 and shaft for the inlet and outlet of steam, connecting through one of its journals, and bears cams K K, for operating valve-plungers B⁴ B⁵. Part B consists of two duplicate side portions,
45 B' B², mounted by bearings B⁶ on shaft A'. These portions fit closely to disk A² and head A³, and have a shell, B³, outside of the track of head A³, which connects them and incloses the steam-chamber F. Annular packing-rings
50 G G', abutting against the sides of disk A² to

prevent the escape of steam from this chamber, are seated in parts B' B², as shown.

Plungers B⁴ B⁵ have seats in shell B³, in which they fit closely and slide in and out to close the chamber F behind head A³, to act as
55 abutments against which the steam expands to cause rotation, and to open it for the passage of part A³. These plungers B⁴ B⁵ are each held by a separate cross-bar and stirrup-frame, which have yoke parts H H' and H² H³ on the
60 two sides, with bifurcated guides on their ends, having slideway-bearings in the outer frames of sides B' B², arranged so they will be held firmly and allowed to slide freely to give motion to the plungers in opening and closing the
65 steam-chamber F.

Parts H H' H² H³ form yokes over shaft A', so as to slide endwise across it the required distance to give motion to the plungers B⁴ B⁵, and have each two followers, h h', which bear
70 on opposite sides of cams K K, to receive such motion during the rotation of engine.

Cams K K are duplicates, on the two sides of the engine, and each has three tracks, K' K² K³, around it, of peculiar forms, as illustrated, to give proper motion to plunger-valves
75 B⁴ B⁵. The two outer tracks on each cam-head are alike, and each has a follower, h', of one of the yoke parts H H' H² H³ bearing on it, to receive motion to push the plungers B⁴ B⁵ out,
80 while the inner tracks, K², are of a different form, and each has the other follower, h, of two of these yoke parts, connected from separate plungers, bearing on its opposite sides, to receive motions to draw the plungers inward.
85 The opposite sides of these two sets of cam-tracks are each of suitable form to conform to the motion given by the other, so as to hold the yoke parts firmly by their two followers h h' in proper position at each portion of the
90 revolution. The relative arrangements of these cams, followers, yoke parts, and the plungers operated by them are illustrated in Figs. 1, 2, and 3 in one position, and in another position, at a quarter-revolution there-
95 from, in Figs. 5, 6, and 7. In these they are represented as if part B were in motion in the direction of the arrows in Fig. 2, while part A is stationary; but by turning one set of
100 figures a quarter round the positions may be

compared as if the part A were in motion in the contrary direction and part B stationary. The relative motions of the two sets of followers connected with each plunger is such as to hold the plungers in, to close the steam-chamber F for more than half a revolution each, and to push them outward to pass part A³, as indicated in dotted lines in Figs. 2 and 6, within the other half-revolution, each in its turn.

Steam is admitted through a steam-chest, C, over one of the journals of shaft A', and exhausted through a passage, E, opening from the same. Two ports open from this chest C for the passage of the steam, and a slide-valve, D, is arranged therein to move back or forth by means of a rod connecting with a hand-lever, D', outside, so as to cover either port and the exhaust-opening E, to exhaust the steam from such port, while leaving the other port open for the admission of live steam to the engine. By sliding this valve back or forth, as illustrated in Figs. 4 and 8, the steam can be turned into either side, to turn the engine either way, and to reverse its motion instantly.

Two separate passages extend from the two ports in the steam-chest C through separate turn-valves, P P', to separate annular spaces c' c² in the journal-bearing, and through separate passages, c³ c⁴, into and through shaft A' and disk A², which open on opposite sides of head A³ into the steam-chamber F at a a'. Through either of these passages the steam enters the chamber F behind head A³, as at a, and forces the head A³ and the plunger B⁴ or B⁵, which closes this chamber behind it, apart, one or the other being movable, the expanded steam at the same time escaping by the other passage before head A³, as at a'. This acts to keep up a continuous rotation of either part A or part B.

If desired, the steam can be taken in solid continuously, or it may be cut off a portion of each revolution and allowed to expand, and this can be regulated by valves P P' to any degree desired, and the speed and force of the engine regulated thereby.

To cut off and regulate the inlet and outlet of steam, the valves P P' are arranged to turn back and forth by cranks, (shown in dotted lines in Fig. 10,) so as to close and open the passage-ways through them at intervals. These cranks have pivoted connecting-bars P² P³, to turn them back and forth as required, which bars have pivots on their other ends arranged to fit and slide in curved ways s s' in an oscillating lever, R, pivoted at R², so as to be moved thrustwise by the motion of this lever to operate the valves, and have levers L L', connected by bars, by which they can be pushed along the slotways in lever R to any distance from pivot R², so as to receive any degree of motion desired. By holding them at the center of this lever R no motion is given and the valves are left open continuously, while the motion and cutting off becomes quicker and greater the greater the distance from the cen-

ter. Either can be moved separately by its hand-lever L L'.

The lever R is operated by an eccentric, M, (shown in dotted lines in Fig. 10,) which is fixed on shaft A' or on the hub of part B, whichever is intended to turn, or onto both for alternative use. This has a connecting-bar, R', moved by it, which is pivoted to lever R to give motion thereto, to operate the valves P P' back and forth once each revolution of the engine, and to such degree for each as regulated by the position of its lever L L', to regulate the speed and power of the engine. In addition to this, a governor may be used in any suitable way to regulate speed.

Various modifications may be made.

The valves B⁴ B⁵, instead of being made as plungers, as shown, may be made like valves P P', Fig. 10, with one side cut away, so that by turning them to a certain point the head A³ can pass, and so that by turning them back the chamber F will be closed, as with the plunger-valve form. In this case the cranks to turn them may be connected by pivots and slots, or by pivoted bars, with yoke parts H H' H² H³, so as to be operated by their movement, as in the case of the plungers.

I reserve such patentable features shown and set forth, but not claimed herein, as may be shown in another application to be filed before the issue of patent hereon, in favor of such application.

I claim—

1. In a rotary engine, the disk A², having head A³, combined with parts B' B² B³, having valve-plungers B⁴ B⁵ therein, and with yoke parts H H' H² H³, having followers h h' and cams K K therefor.

2. In a rotary engine, the disk A², having head A³ and steam-passages a a', combined with parts B' B² B³ and plungers B⁴ B⁵, held by yoke-frames having followers on cams K K.

3. A slide-frame, H, having two followers, h h', combined with the valve B⁴ of a rotary-engine steam-chamber, connected to be operated by frame H, and with a cam, K, having a separate track for each follower, of forms to correspond, so as to hold the two followers in contact on opposite sides during the rotation, to operate frame H and the valve B⁴.

4. In a rotary engine, the disk A², having head A³ and steam-passages a a', combined with parts B' B² B³, having steam-chamber F, and two valves, B⁴ B⁵, adapted to open and close the same, with cams K K, and with followers h h', connected to operate the valves.

5. The slide-valve D, having handle D', combined with two turn-valves, P P', having cranks and operating-bars, and having passages through them controlled by valve D.

6. In an engine, the turn-valve P, combined with eccentric M and with oscillating lever R, connected to operate the valve.

7. In an engine, the turn-valve P, combined with oscillating lever R, having slot-way S therein, and with a lever-handle, L,

connected with a sliding pivot in slot S and with valve P, to be operated thereby.

8. In an engine, the combination of an outer shell part, B, with an inner shaft part, A, bearing a rotary valve or piston, each adapted to turn by the force of the steam while the other is held stationary, in alternative order.

9. The rotary engine, having disk A², with head A³ and steam-passages *a a'*, combined

with parts B' B², having valves B⁴ B⁵, provided with yokes bearing followers *h h'*, and with cams K K therefor, and with reverse-valve D and regulating-valves P P'.

HENRY S. PERKINS.

Witnesses:

U. C. VINSON,
A. N. GLENN.