

(No Model.)

3 Sheets—Sheet 1.

C. F. SLEIGH & H. V. SMITH.
ROTARY ENGINE.

No. 355,479.

Patented Jan. 4, 1887.

Fig. 1.

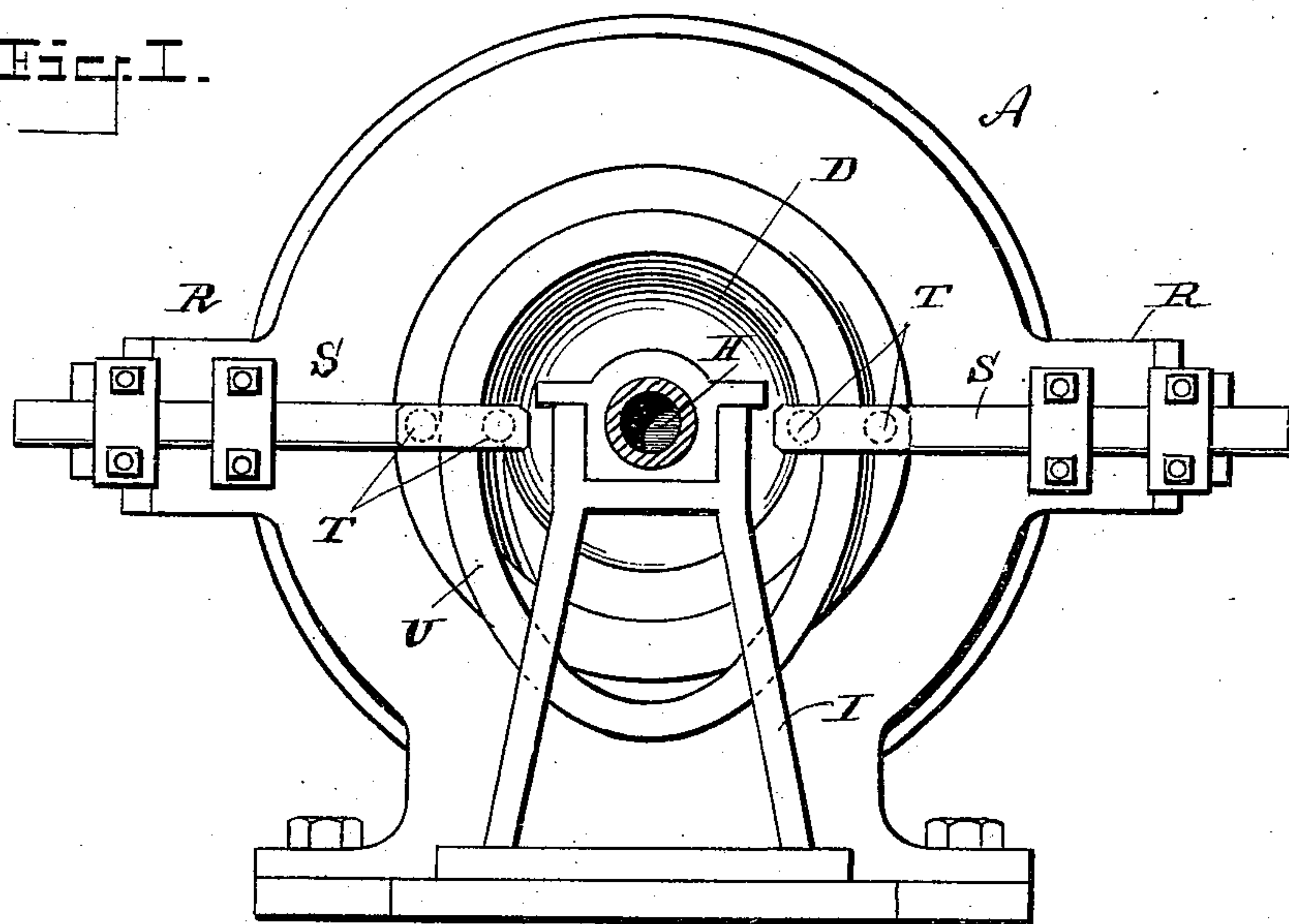
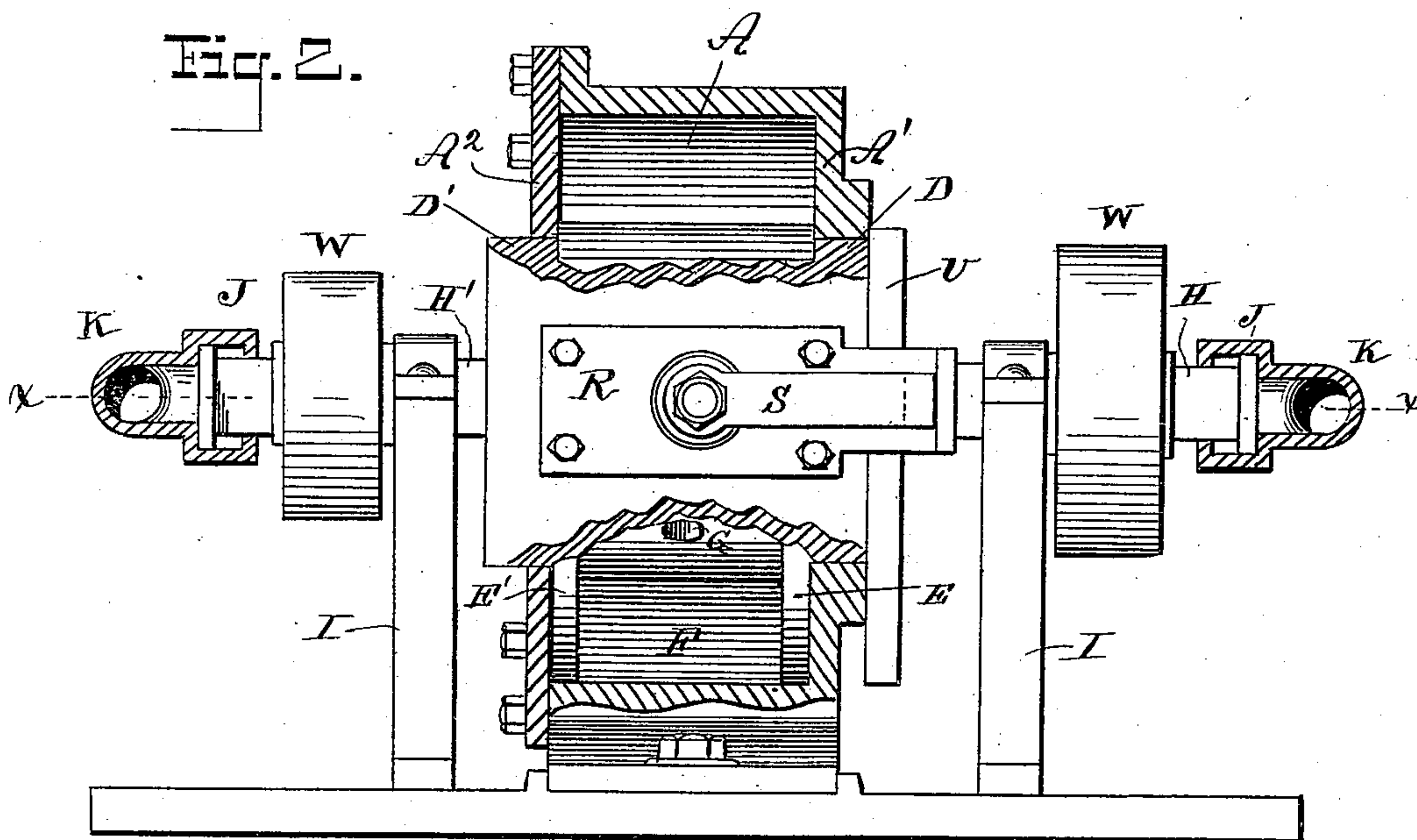


Fig. 2.



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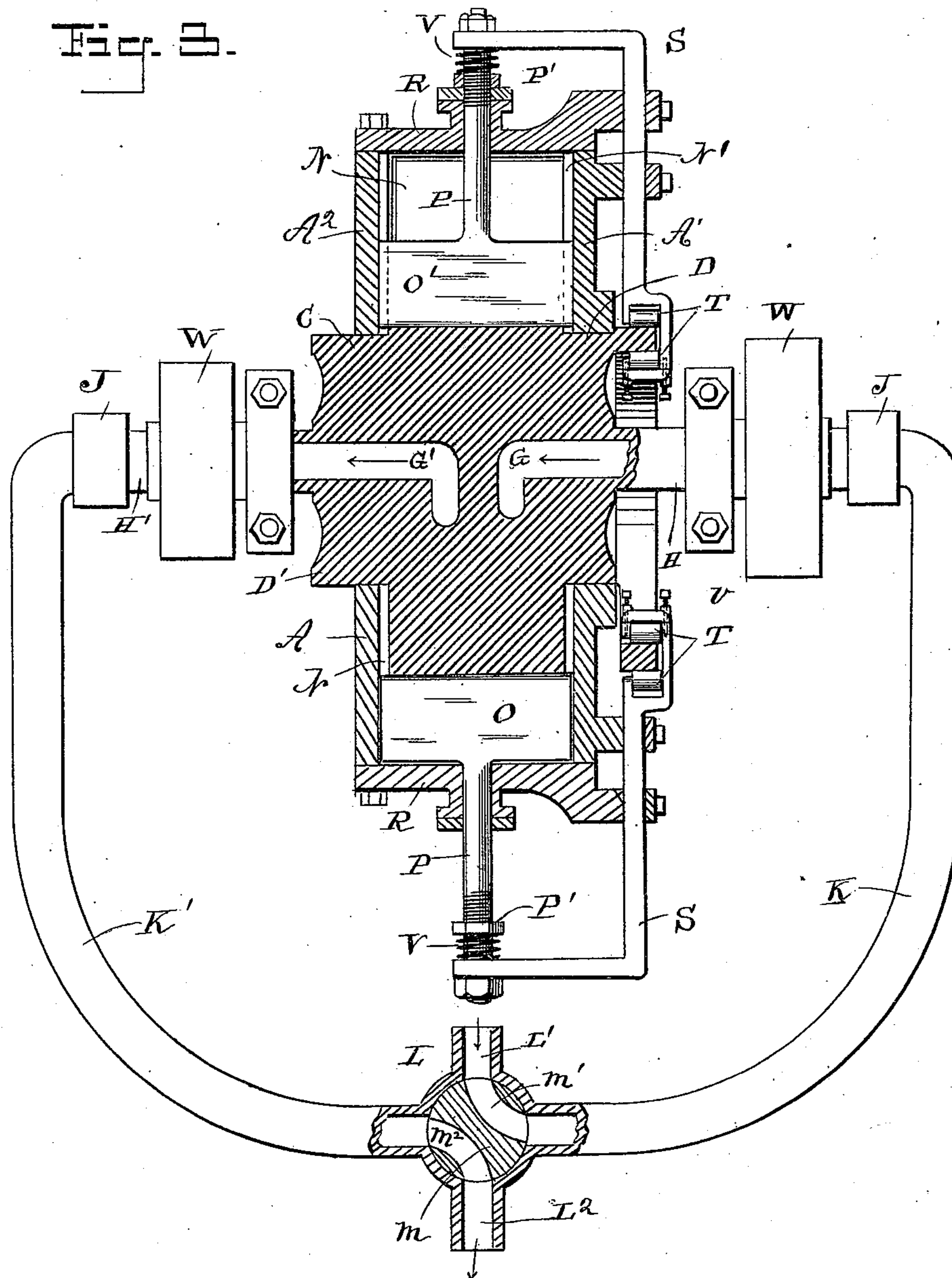
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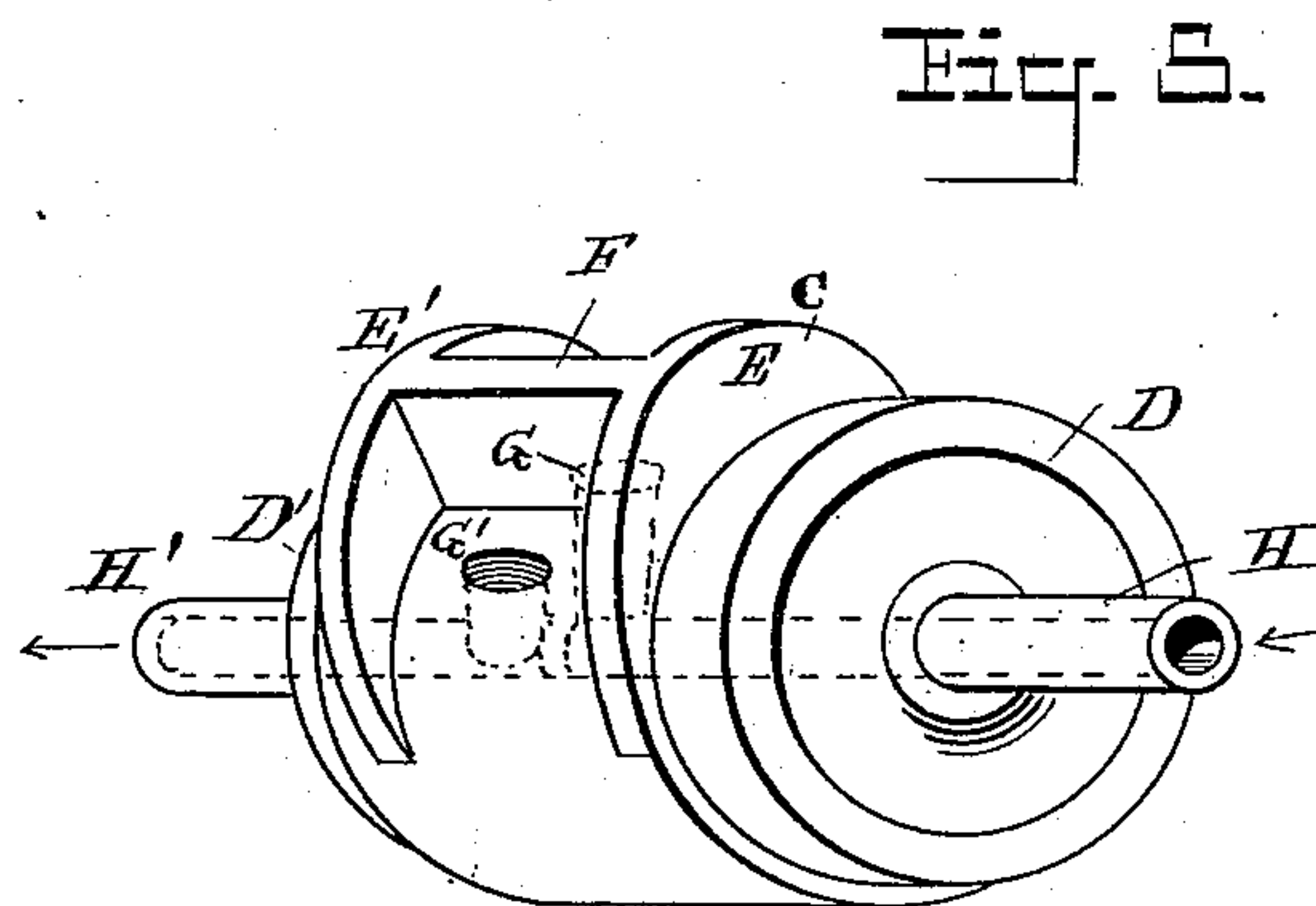
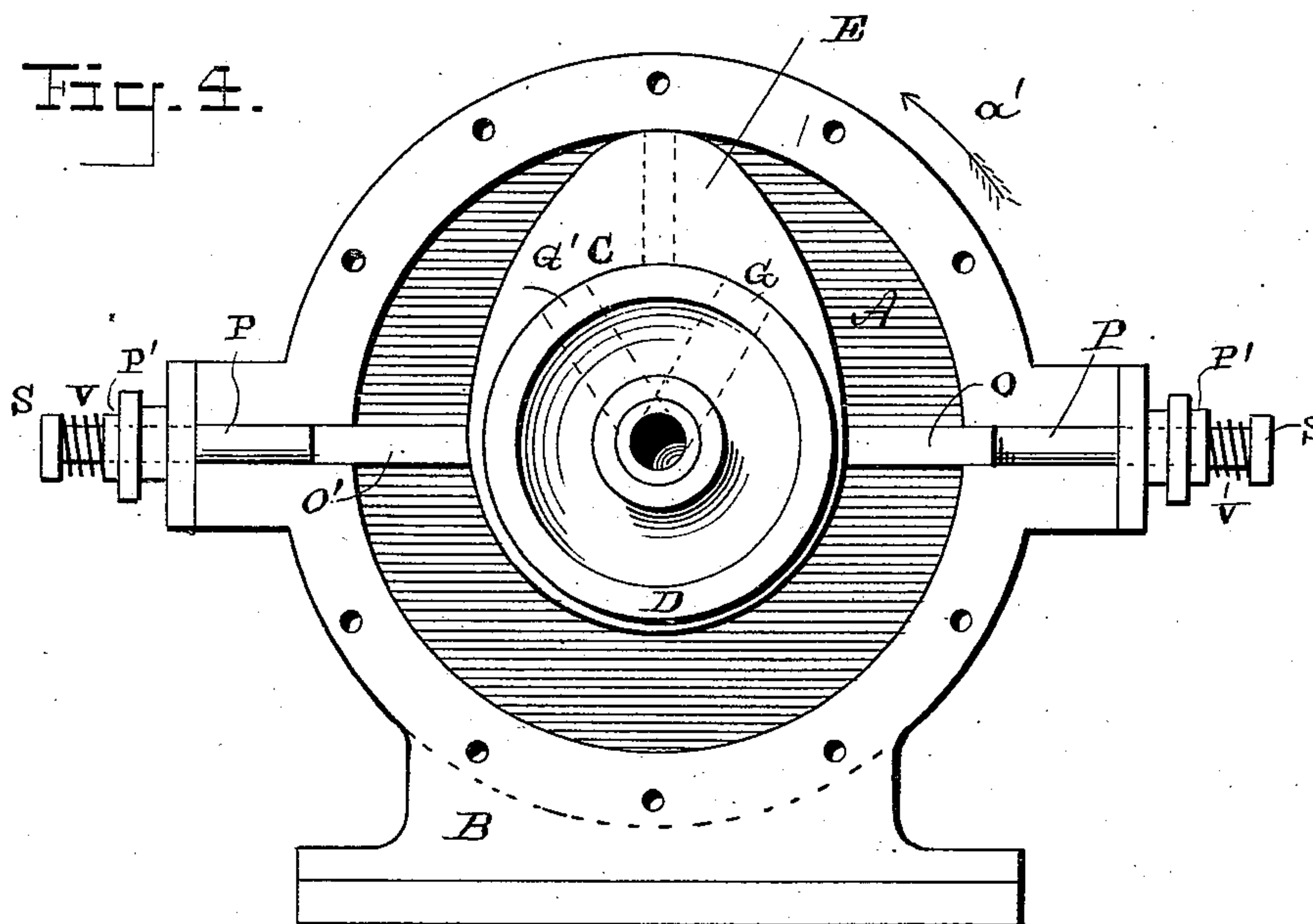
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UNITED STATES PATENT OFFICE.

CHARLES F. SLEIGH AND HARRIE V. SMITH, OF PARKERSBURG, W. VA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 355,479, dated January 4, 1887.

Application filed August 24, 1886. Serial No. 211,745. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. SLEIGH and HARRIE V. SMITH, of Parkersburg, in the county of Wood and State of West Virginia, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The object of our invention is to provide a new and improved rotary engine which is simple and durable in construction, effective in operation, and is reversible.

The invention consists of an elongated piston turning in a cylinder in which slide two gates operated from a cam on the piston, of steam inlet and outlet ports entering the cylinder through the piston, and of a device for reversing the engine.

The invention also consists of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of our improvement. Fig. 2 is an end elevation of the same, parts being broken out. Fig. 3 is a sectional plan view of the same on the line xx of Fig. 2. Fig. 4 is a side elevation of the same with the cylinder-head removed, and Fig. 5 is a perspective view of the piston.

The steam-cylinder A is provided with a base, B, secured to a suitable frame or foundation. In the cylinder A operates a piston, C, consisting of the hubs D and D', having their bearings in the cylinder-wall A' and in the cylinder-head A², and of side flanges, E and E', united at their upper edges by a partition, F. The side flanges, E and E', fit closely against the cylinder-wall and the cylinder-head, respectively, and the upper edge of the partition F fits against the periphery of the cylinder A, and may be provided with any suitable packing, so as to form a steam-tight contact. The steam-ports G and G', formed in the hubs D and D', connect with the pipes H and H', projecting from the hubs D and D', and open inwardly into the cylinder A on each side of the partition F between the said flanges E and E'.

The pipes H and H' have their bearings in the standards I, and are connected at their

outer ends by the couplings J with the stationary pipes K and K', which terminate in the throttle-valve L, provided with the steam-inlet pipe L' and the exhaust-pipe L², and also having the valve M, provided with the passage-ways M' and M², connecting the pipes L' and L² with the pipes K and K', respectively.

In the cylinder A are formed, diagonally opposite each other, guideways N and N', in which slide the gates O and O', respectively, each gate being provided with a rod, P, having its bearing in the offset R on the cylinder A, and carrying on its outer end a bent arm, S, on which are mounted the friction-rollers T, operating on the egg-shaped cam U, secured to the outer edge of the hub D of the piston F. On the rod P is coiled a spring, V, resting at its ends between the adjustable nut P', fixed on the rod P and the arm S.

The operation is as follows: The steam admitted to the inlet-pipes L' and K passes into the cylinder A by the inlet-port G on one side of the partition F, and exerts its pressure against the piston C, as the gate O prevents the steam from passing to the other side of the partition F, thereby rotating the piston C in the direction of the arrow a' . (See Fig. 4.) The gates O and O' move correspondingly with each rotation of the piston C, as the shape of the cam U corresponds with the shape of the piston C, and when the partition F in the piston C has passed the gate O' the live steam from the inlet-port G passes into the cylinder A between the gate O' and the partition F, and thus compels the piston C to continue its rotation in the direction of the arrow a' . The dead steam in front of the piston passes into the port G' and into the pipe H', and is discharged through the throttle-valve by the passage-way M² and the exhaust-pipe L². It will be seen that the gates O and O' are operated indirectly from the piston C by means of the cam U, secured to the latter on its outside hub, D, and the shape of the cam U corresponds to the shape of the piston C. The engine is reversed by turning the valve M so that the passage-way M² connects the inlet-pipe L' with the pipe K, and the passage-way M' connects the exhaust-pipe L² with the pipe K'. The steam then enters the cylinder A by the port G' on the other side of the partition F, and thereby causes the piston to turn in the inverse direc-

tion of the arrow a' . The driving-pulleys W, mounted on the pipes H and H', with the piston C, transmit the rotary motion of the piston C in any desired manner.

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

1. In a rotary steam-engine, the combination, with the cylinder, of the piston having ports
10 connected with a reversible valve and the gates operated by a cam applied directly to said piston, substantially as and for the purpose set forth.

2. In a rotary steam-engine, the combination,
15 with the cylinder A, of the pistons C, having the ports G and G' and provided with the side flanges, E and E', and the partition F, the reversible valve M, connected with the said ports G and G', the gates O and O', sliding in guides
20 formed in the cylinder A, and the cam U, secured to the hub D of the piston C and operating the said gates O and O' by means of suitable connections, substantially as shown and described.

3. In a rotary engine, the combination, with
25 the cylinder A, having the guideways N and N', of the piston C, having the ports G and G' and provided with the flanges E and E', and the partition F, the cam U, secured to the said piston on the outside of the cylinder A, the
30 friction-rollers T, operating on the said cam and mounted on the arms S, and the gates O and O', sliding in the said guideways N and N' and connected with the said arms S by the
35 rods P, substantially as shown and described.

4. In a rotary steam-engine, the combination,
of the cylinder A with the piston C, having the
ports G and G' and provided with the side
flanges, E and E', and the partition F, the gates
O and O', sliding in the said cylinder A and
40 operated by a cam U, secured to the hub D of the said piston C, substantially as shown and described.

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Witnesses:

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