

No. 883,605.

PATENTED MAR. 31, 1908.

A. E. ABBOTT.
ROTARY ENGINE.

APPLICATION FILED OCT. 3, 1907.

4 SHEETS—SHEET 1.

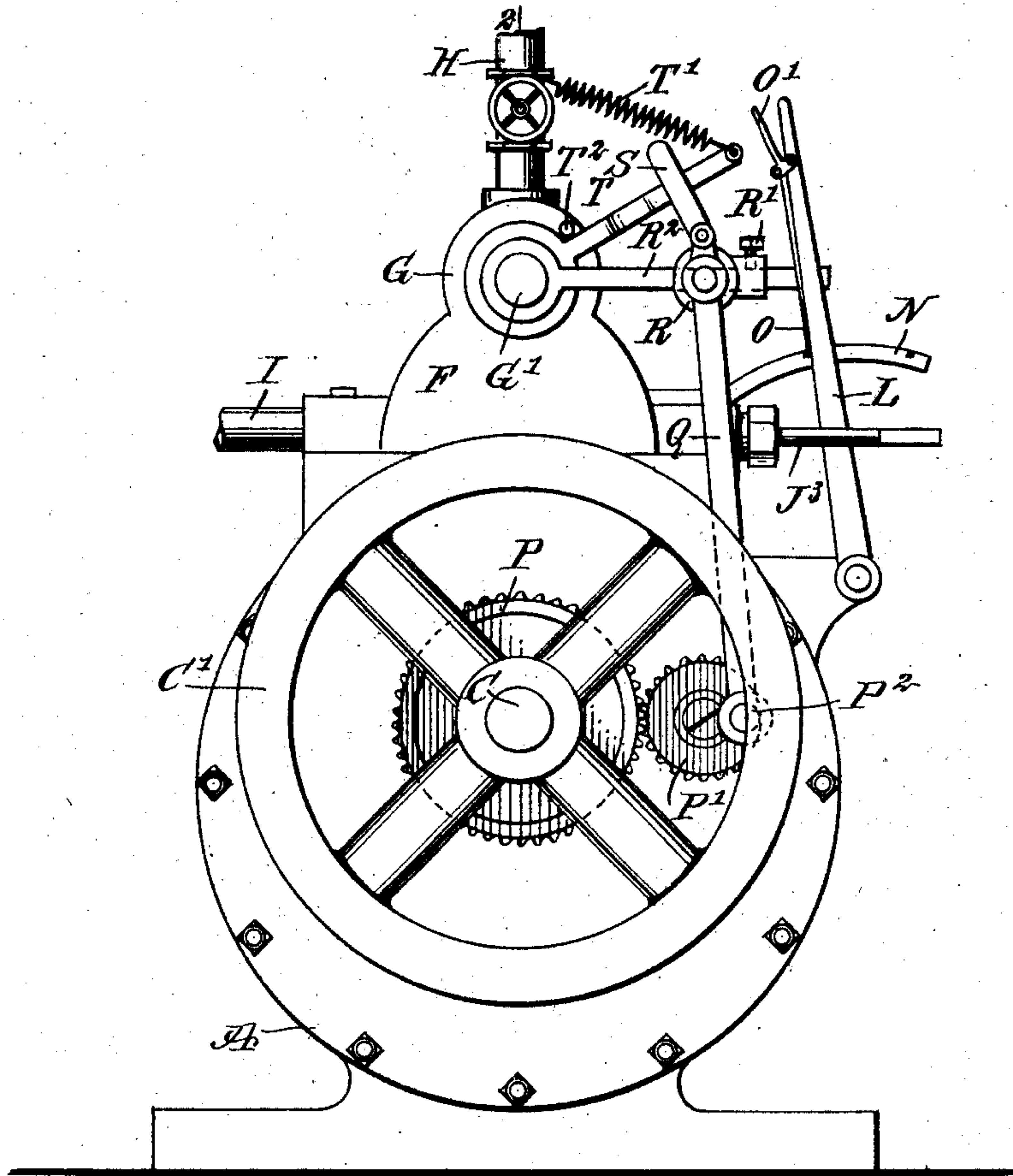
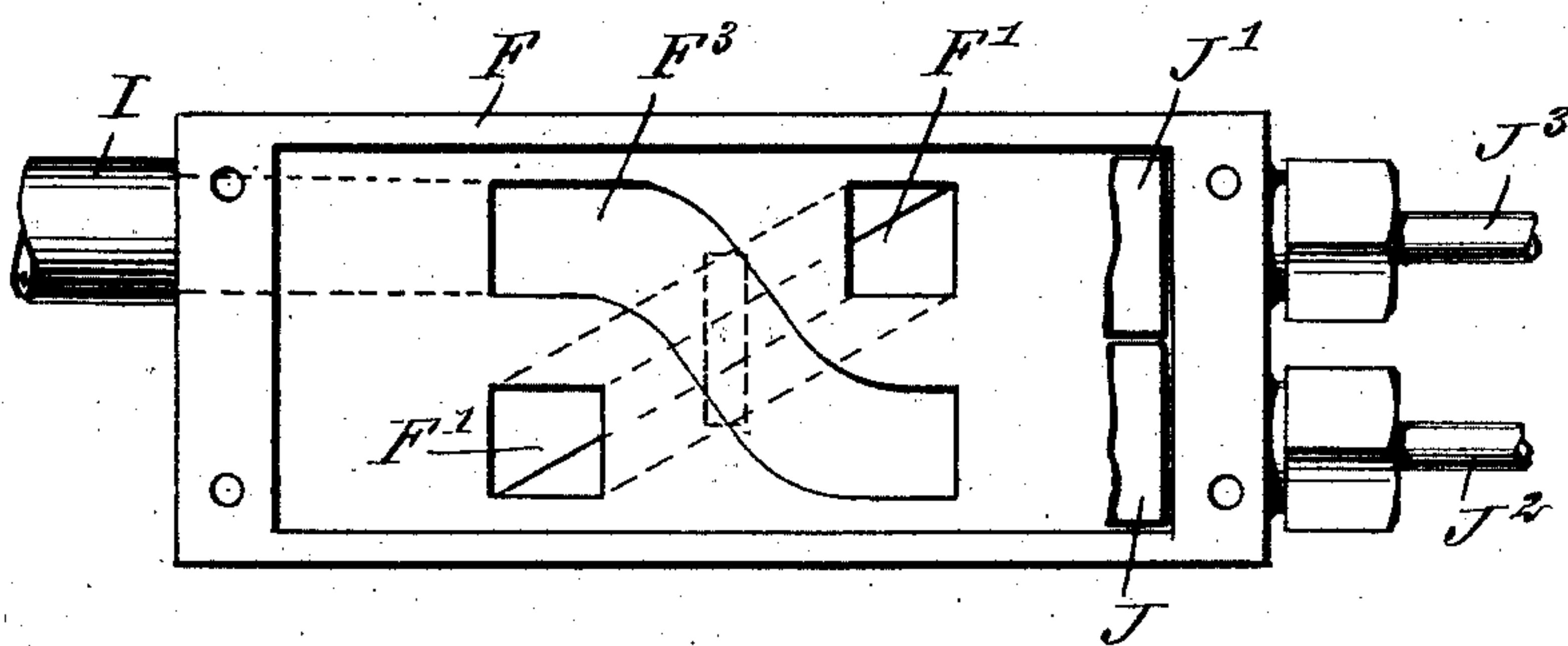


Fig. 1



WITNESSES
John A. Sengstrom
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Fig. 7

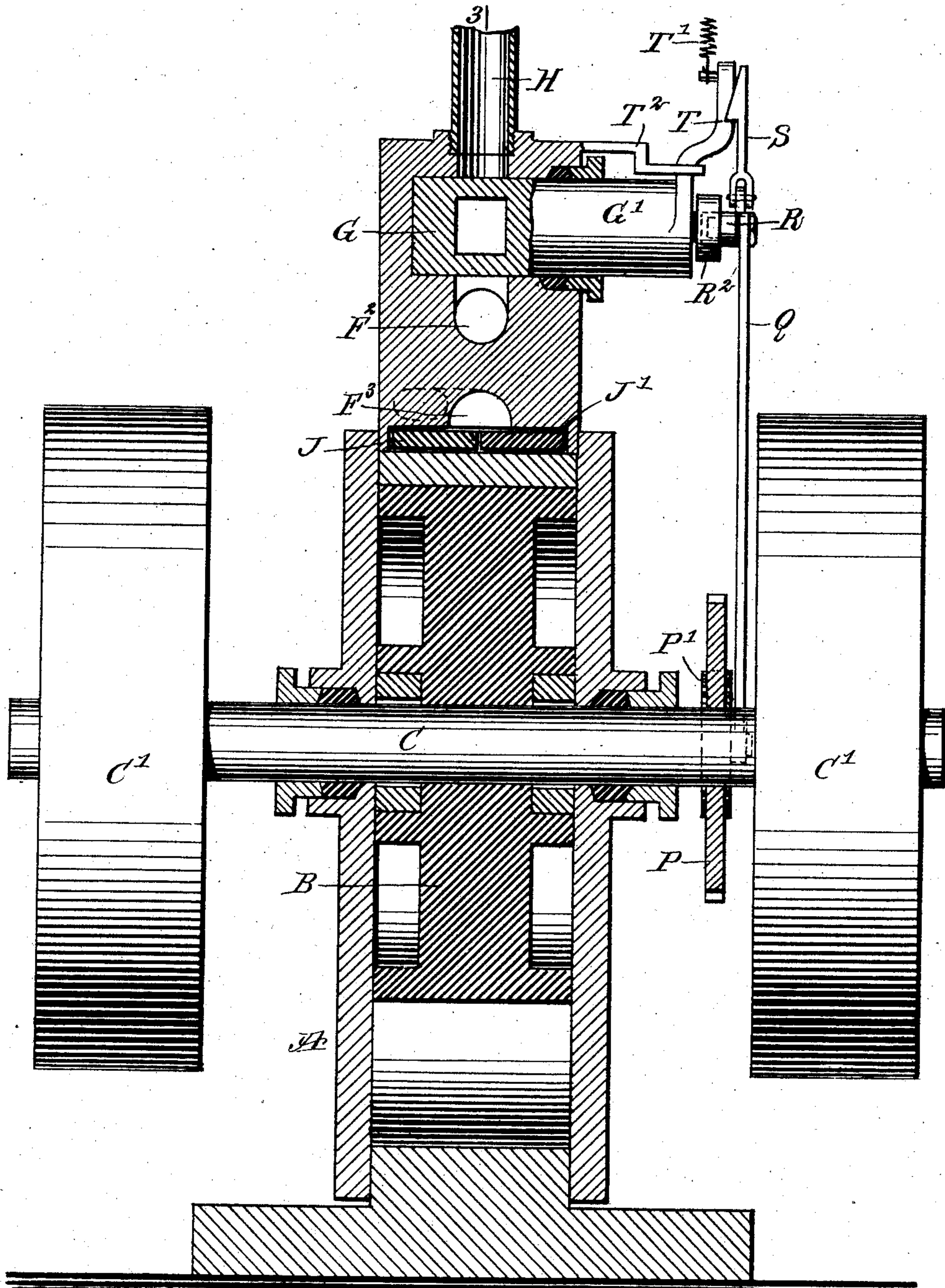
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4 SHEETS—SHEET 2.



WITNESSES

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Fig. 2

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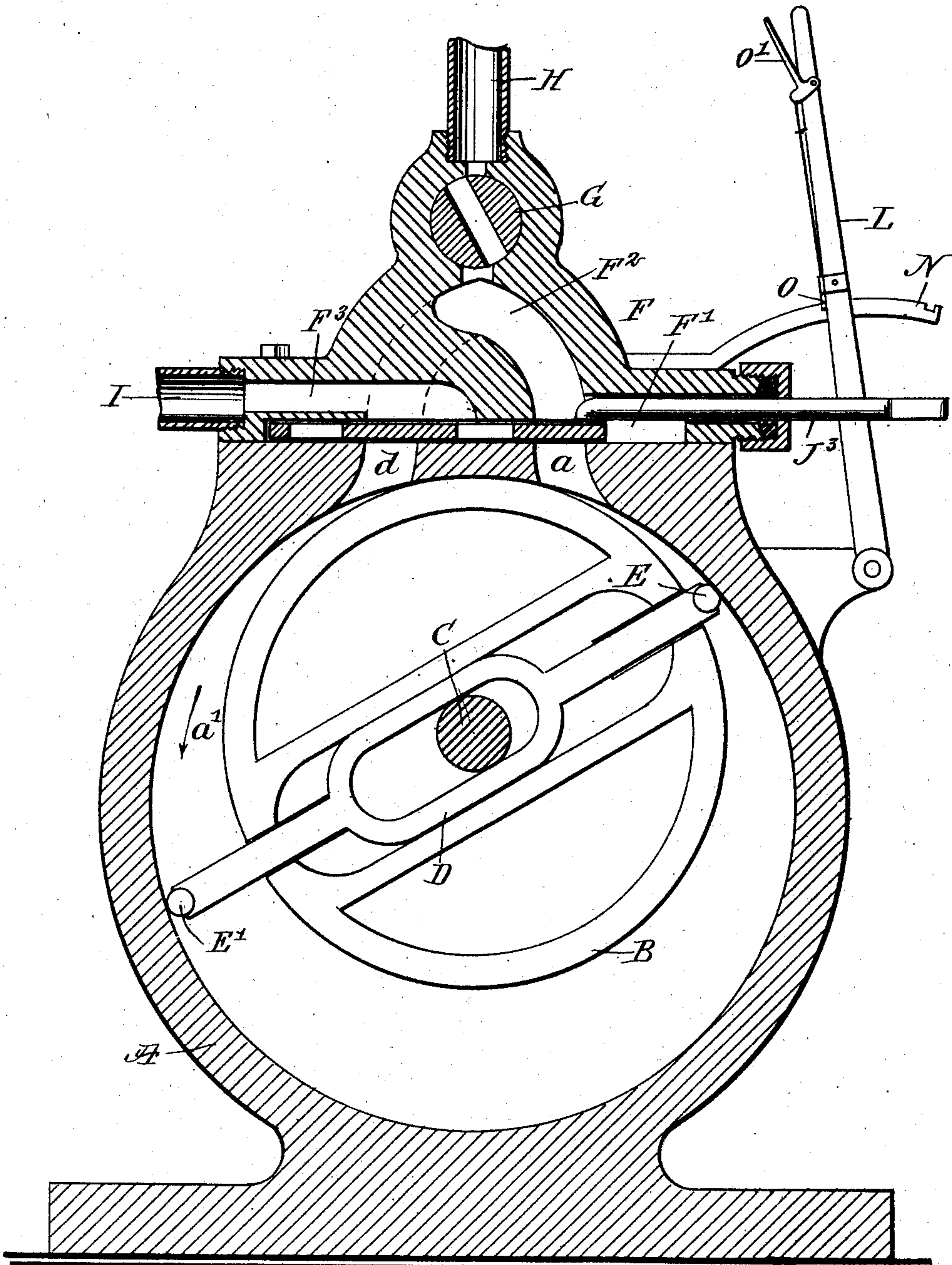
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4 SHEETS--SHEET 3.



WITNESSES

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Fig. 3

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4 SHEETS—SHEET 4.

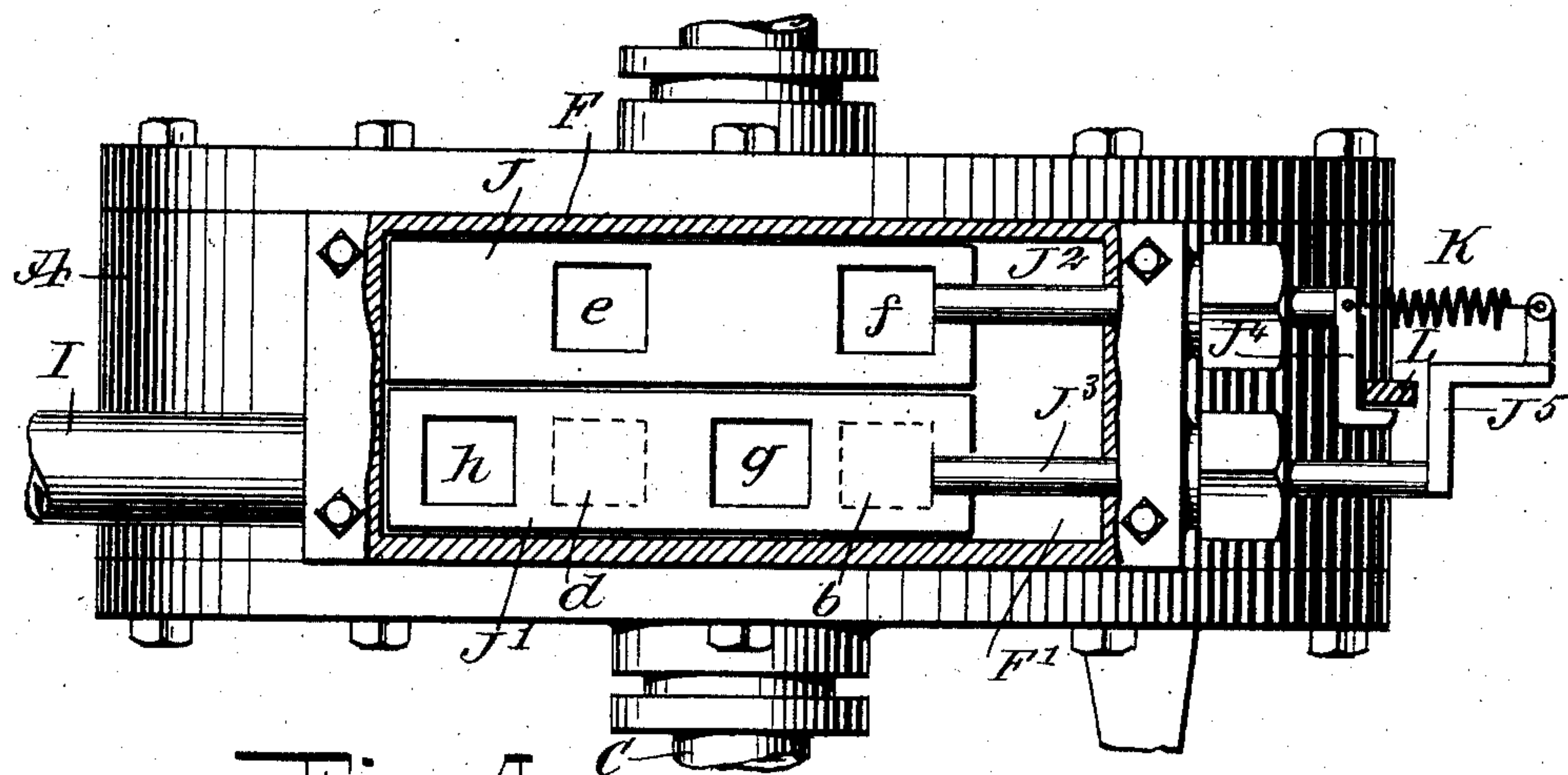


Fig. 4

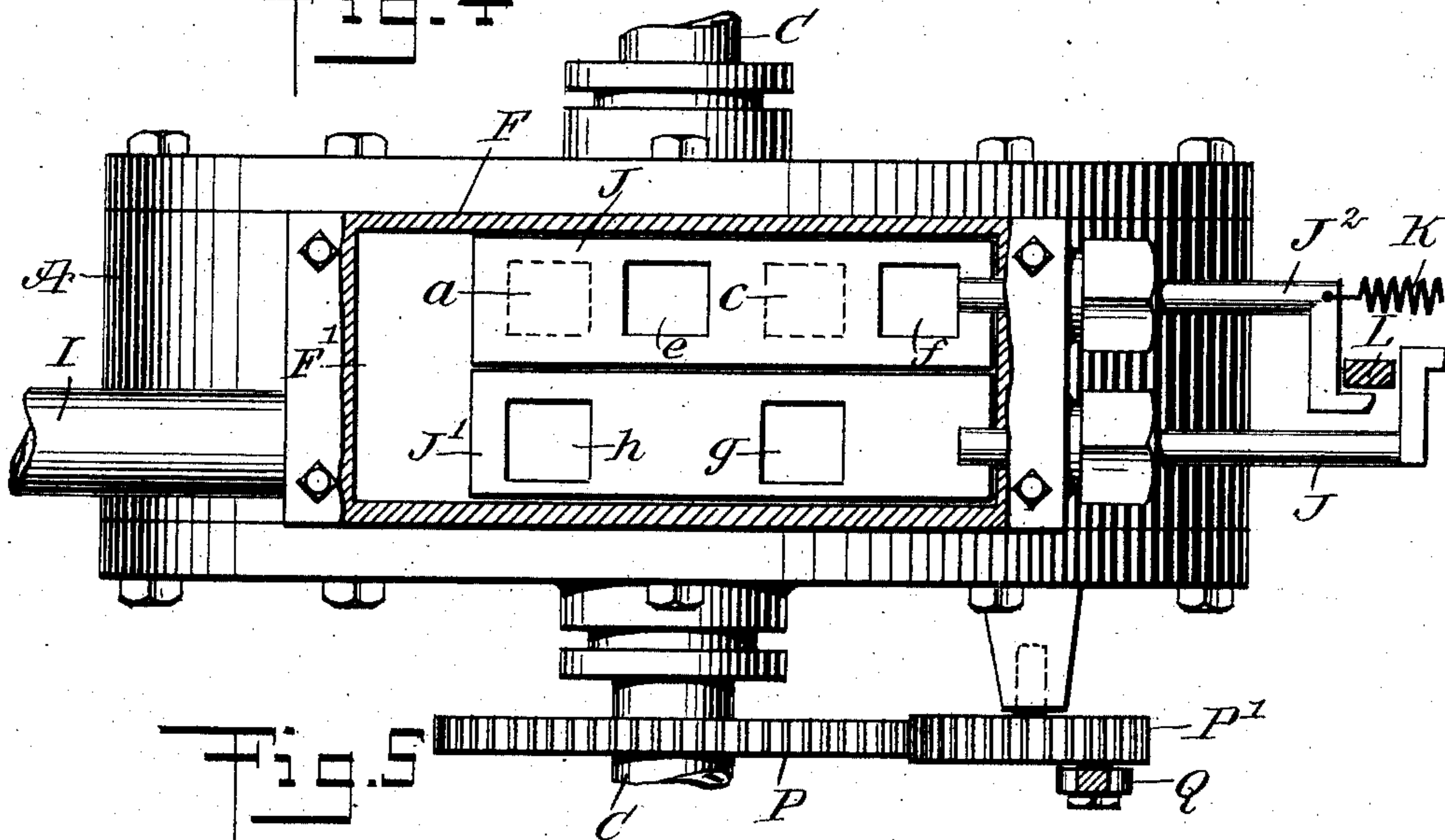


Fig. 5

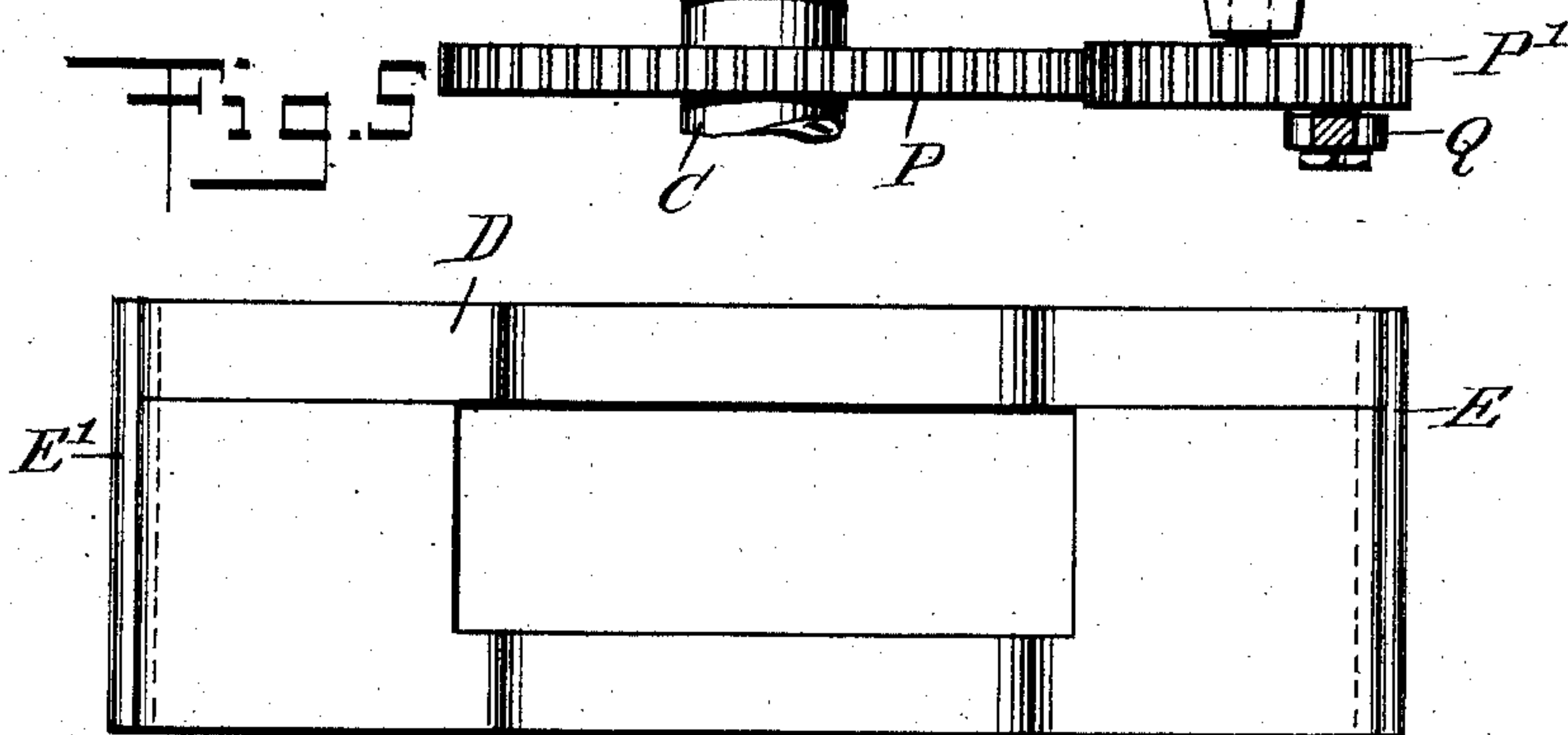


Fig. 6

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UNITED STATES PATENT OFFICE.

AMBROSE EDGAR ABBOTT, OF RHYOLITE, NEVADA.

ROTARY ENGINE.

No. 883,605.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed October 3, 1907. Serial No. 395,664.

To all whom it may concern:

Be it known that I, AMBROSE EDGAR ABBOTT, a citizen of the United States, and a resident of Rhyolite, in the county of Nye and State of Nevada, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved rotary engine which is simple and durable in construction, very effective in operation, easily and quickly reversed, and arranged to utilize the motive agent to the fullest advantage.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a reduced end elevation of the improvement; Fig. 2 is a longitudinal central section of the same on the line 2—2 of Fig. 1; Fig. 3 is a cross section of the same on the line 3—3 of Fig. 2; Fig. 4 is a plan view of the same, part of the steam chest containing the reversing valves being shown in section; Fig. 5 is a like view of the same showing the valves in a different position; Fig. 6 is a plan view of the piston head; and Fig. 7 is an inverted plan view of the steam chest containing the reversing valves.

In the cylinder A is eccentrically mounted the piston or rotator B secured on a shaft C journaled in suitable bearings in the heads of the cylinder A and carrying at its outer ends pulleys or fly wheels C' for transmitting the rotary motion of the piston B to other machinery. In the piston B is mounted to slide diametrically the piston head D provided at its ends with rollers E, E' in contact with the inner peripheral surface of the cylinder A at opposite points thereof, as plainly indicated in Fig. 3. The cylindrical piston B is in contact with the inner surface of the cylinder A at one point thereof, preferably at the top, as shown in Fig. 3, and into the said cylinder A at opposite sides of the said contacting point are arranged a set of admission ports *a* and *b*, and a set of exhaust ports *c* and *d*, the ports in each set being disposed crosswise one to the other, as plainly indicated in Figs. 4 and 5. The ports *a*, *b*, *c*, and *d* open into

a compartment F' formed in the steam chest F, and connected by a steam admission cross channel F² with a cut-off valve G connected with the supply pipe H leading to a boiler or other source of motive agent supply, the said admission cross channel having its terminals directly above the ports *a* and *b*. The compartment F' is also connected by an exhaust cross channel F³ with an exhaust pipe I to conduct the exhaust motive agent to a suitable place of discharge. The terminals of the exhaust cross channel F³ are directly above the exhaust ports *c*, *d*.

In the compartment F', and over the ports *a*, *c* and *b*, *d*, are mounted to slide the slide valves J and J' having ports *e*, *f* and *g*, *h*, respectively, of which the ports *e*, *f* are in register with the ports *a* and *c* and the ports *g*, *h* are closed and out of register with the ports *b*, *d* at the time the engine is moving forward in the direction of the arrow *a'* (see Figs. 3 and 4) and when the engine is to run in the reverse direction the valves J and J' are moved to the position shown in Fig. 5 so that the ports *g*, *h* are in register with the ports *b*, *d* while the ports *a*, *c* are closed and out of register with the ports *e*, *f*. The valve stems J² and J³ of the slide valves J and J' are connected with each other at their outer ends by a spring K, and between the angular ends J⁴, J⁵ of the stems J², J³ extends a lever L under the control of the operator, for shifting the positions of the valves J and J' for forward movement or a reversing of the engine, as above described.

The lever L is adapted to be locked to the usual notched segment N by a catch O controlled by a lever O' on the hand lever L, so as to lock the valves J and J' in either of the desired positions, that is, either in a forward or reversing position, as indicated in Figs. 4 and 5.

The cut-off valve G is preferably in the form of a rocking valve, adapted to be rocked from the main shaft C, the latter being for this purpose provided with a gear wheel P in mesh with a pinion P' having a wrist pin P² connected by a pitman Q with a sleeve R adjustably secured by a set screw R' to an arm R² mounted to swing loosely on the valve stem G' of the cut-off valve G.

On the sleeve R² is pivoted a hook S for engaging an arm T secured to the valve stem G' and pressed on by a spring T' to normally hold the arm T against a stop T². When the engine is running the pinion P' which acts as

a crank arm imparts by the pitman Q a swinging motion to the arm R² which by the hook S imparts a downward swinging motion to the arm T so that the valve G is rocked into open position to connect the supply pipe H with the admission cross channel F², the spring T' returning the arm T on the return or upward movement of the arm R². By adjusting the sleeve R on the arm R² the valve G can be opened sooner or later and for a greater or shorter length of time. It is understood that the pinion makes two revolutions to each revolution of the gear wheel P to admit steam twice to the channel F² for each revolution of the piston B. Now by the arrangement described the rock valve G is rocked to cut off the steam at the desired point and thus allow using the steam expansively.

When the parts are in the several positions illustrated in Figs. 2, 3 and 4, then the live motive agent admitted to the admission cross channel F² passes by way of the registering ports *e* and *a* into the cylinder A, to turn the piston B in the direction of the arrow *a'*. The exhaust of the motive agent now takes place from the cylinder A by way of the registering ports *c* and *f* conducting the exhaust steam into the exhaust cross channel F³ from which the exhaust steam can pass by way of the exhaust pipe I to a suitable place of discharge.

Now when it is desired to reverse the engine, then the operator swings the hand lever L over to the right, so that the lever L engages the angular arm J⁴, thus shifting the valve J from the left to the right and with it the other valve J', owing to the spring K connecting the two valve stems J², J³ with each other, the said valves then assuming the position illustrated in Fig. 5. When this takes place the motive agent now passes from the admission cross channel F² by way of the registering ports *g* and *b* into the cylinder A at the right hand side thereof, so as to turn the piston B in the inverse direction of the arrow *a'*. The exhaust motive agent now passes out of the cylinder A by way of the registering ports *d*, *h* conducting the exhaust into the exhaust cross channel F³ from which the exhaust can pass by way of the exhaust pipe I into a suitable place of discharge.

The improved rotary engine shown and described is comparatively simple, and composed of few parts, not liable easily to get out of order.

By the simple valve arrangement shown and described, the engine can be quickly and conveniently reversed whenever it is desired to do so.

Having thus described my invention, I claim as new and desire to secure by Letters-Patent:

1. A rotary engine comprising a cylinder, a rotatable piston in the cylinder, a steam chest, reversible slide valves in the steam

chest and controlling the inlet, and exhaust of the motive engine to and from the cylinder; a hand lever for engaging the valve stems of the said slide valves and a spring for connecting the said valve stems with each other.

2. A rotary engine comprising a cylinder having sets of admission ports and sets of exhaust ports, a rotatable piston in the cylinder, a steam chest having a live steam cross channel and an exhaust cross channel, and manually controlled slide valves in the said steam chest and controlling the said sets of ports and channels.

3. A rotary engine comprising a cylinder, a main shaft, a piston on the said shaft and eccentrically mounted in the said cylinder and in contact with the inner surface of the cylinder at one point, the said piston having a sliding piston head in contact at both ends with the interior of the cylinder at opposite points, a steam chest, reversible slide valves in the said steam chest and controlling the inlet and exhaust of the motive agent to and from the cylinder, means for shifting the slide valves, one for forward travel and the other for reversing, a rock valve for controlling the admission of the motive agent to the said steam chest, and means actuated from the said main shaft for rocking the said rock valve.

4. A rotary engine comprising a cylinder, a main shaft, a piston on the said shaft and eccentrically mounted in the said cylinder and in contact with the inner surface of the cylinder at one point, the said piston having a sliding piston head in contact at both ends with the interior of the cylinder at opposite points, a steam chest, reversible slide valves in the said steam chest and controlling the inlet and exhaust of the motive agent to and from the cylinder, a hand lever for engaging the valve stems of the said slide valves, and a spring for connecting the said valve stems with each other.

5. A rotary engine comprising a cylinder having sets of admission ports and sets of exhaust ports, a piston eccentrically mounted in the said cylinder and having a sliding piston head, the said piston being in contact with the inner surface of the cylinder at a point between the ports of the said sets of ports, a steam chest having a live steam cross channel and an exhaust cross channel, and manually controlled slide valves in the said steam chest and controlling the said sets of ports and channels.

6. A rotary engine comprising a cylinder having sets of admission ports and sets of exhaust ports, a piston eccentrically mounted in the said cylinder and having a sliding piston head, the said piston being in contact with the inner surface of the cylinder at a point between the ports of the said sets of ports, a steam chest having a live steam

cross channel and an exhaust steam cross
channel, manually controlled slide valves in
the said steam chest and controlling the said
sets of ports and channels, and a cut-off valve
5 for controlling the admission of the steam to
the said live steam compartment.

In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

AMBROSE EDGAR ABBOTT.

Witnesses:

R. A. ABBOTT,
D. ALLEN.