No. 865,804. PATENTED SEPT. 10, 1907.

S. S. SADORUS.

ROTARY ENGINE.

APPLICATION FILED APR. 19, 1907.

3 SHEETS—SHEET 1.

Fig. 2.

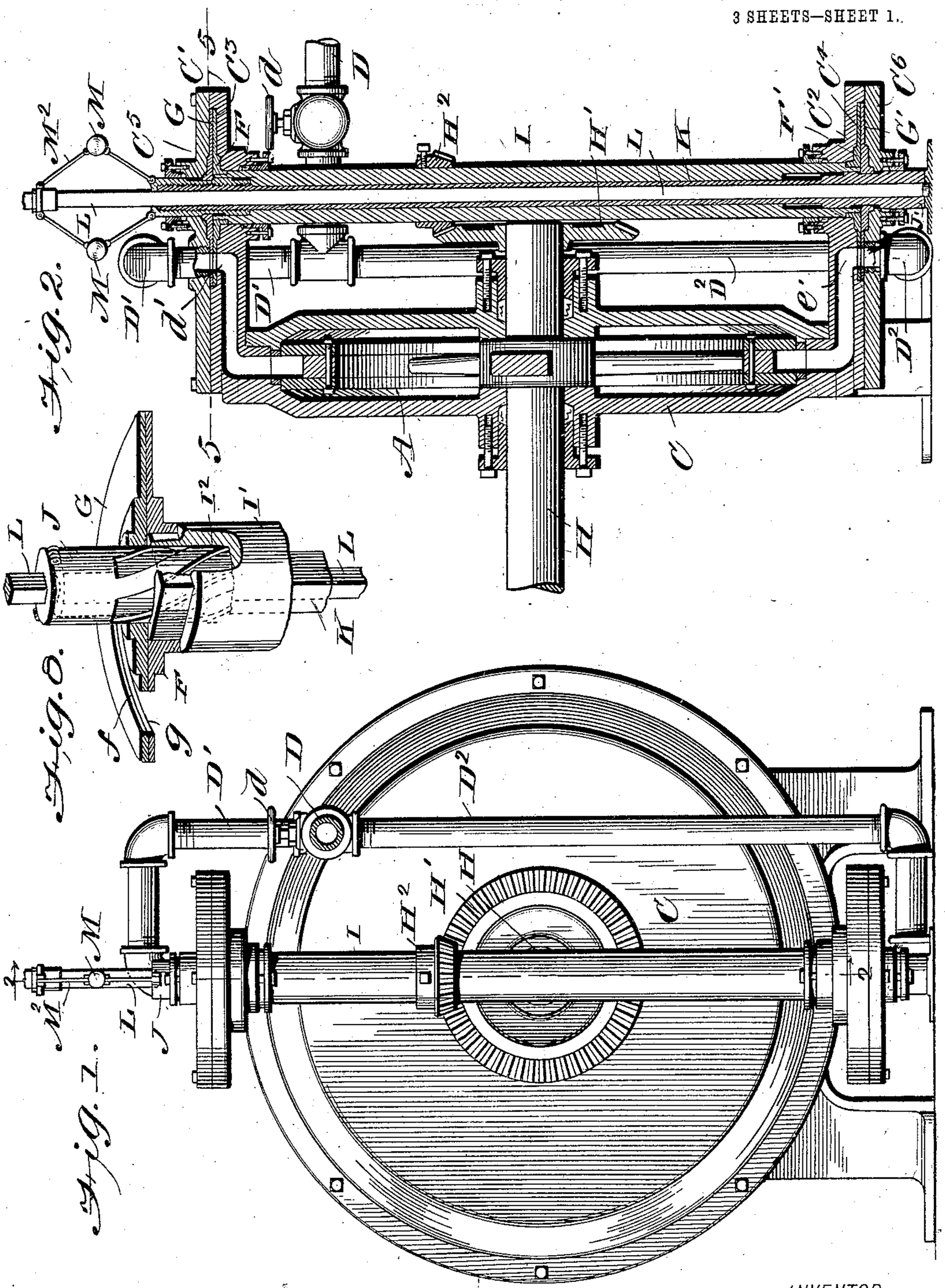

Fig. 3.

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

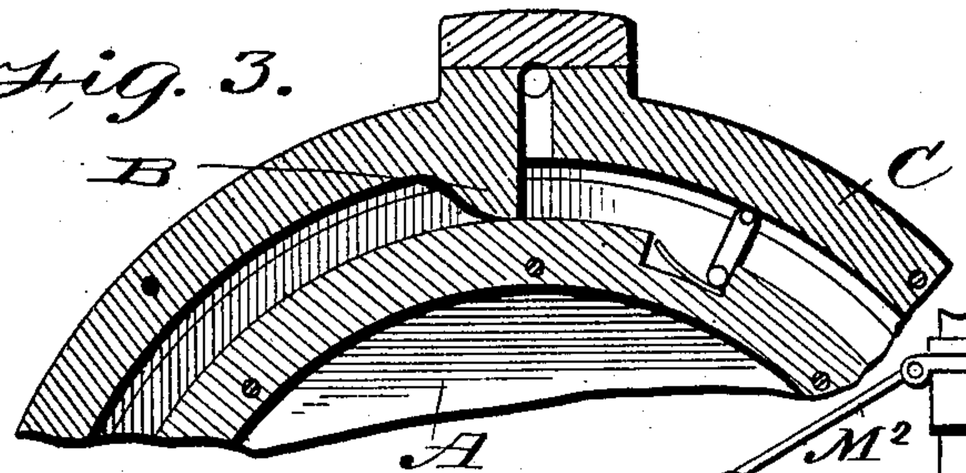


Fig. 4.

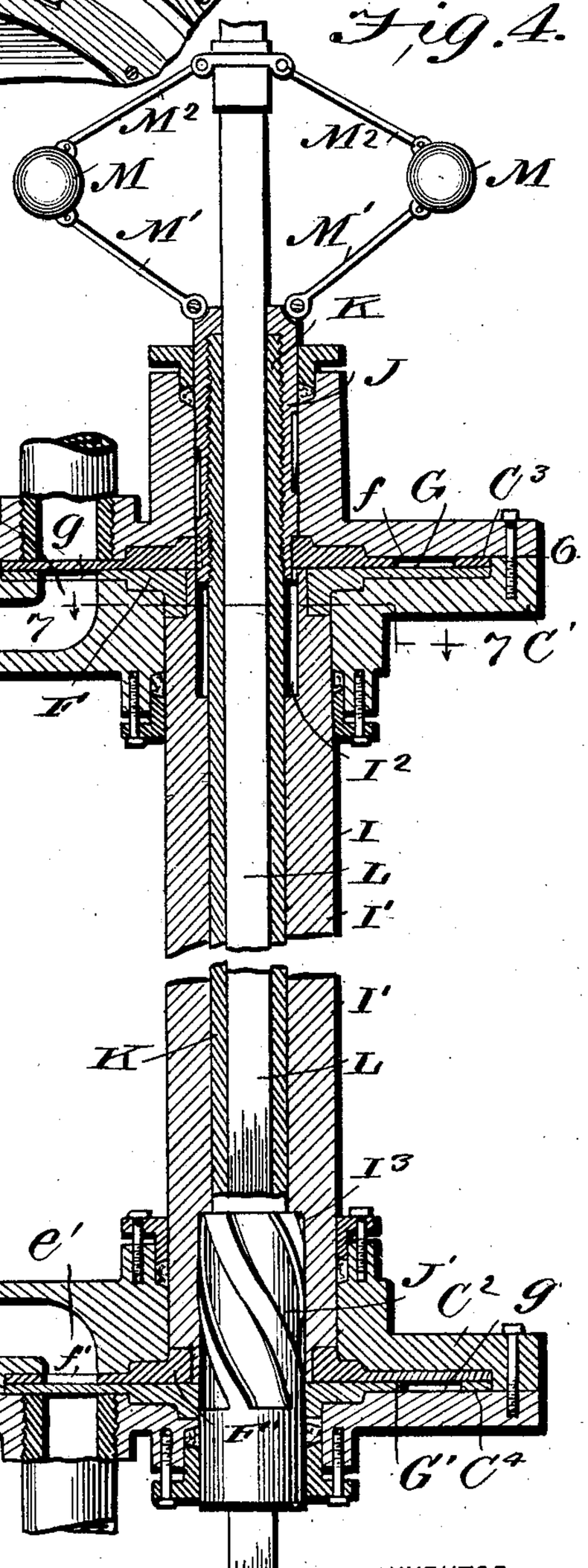


Fig. 5.

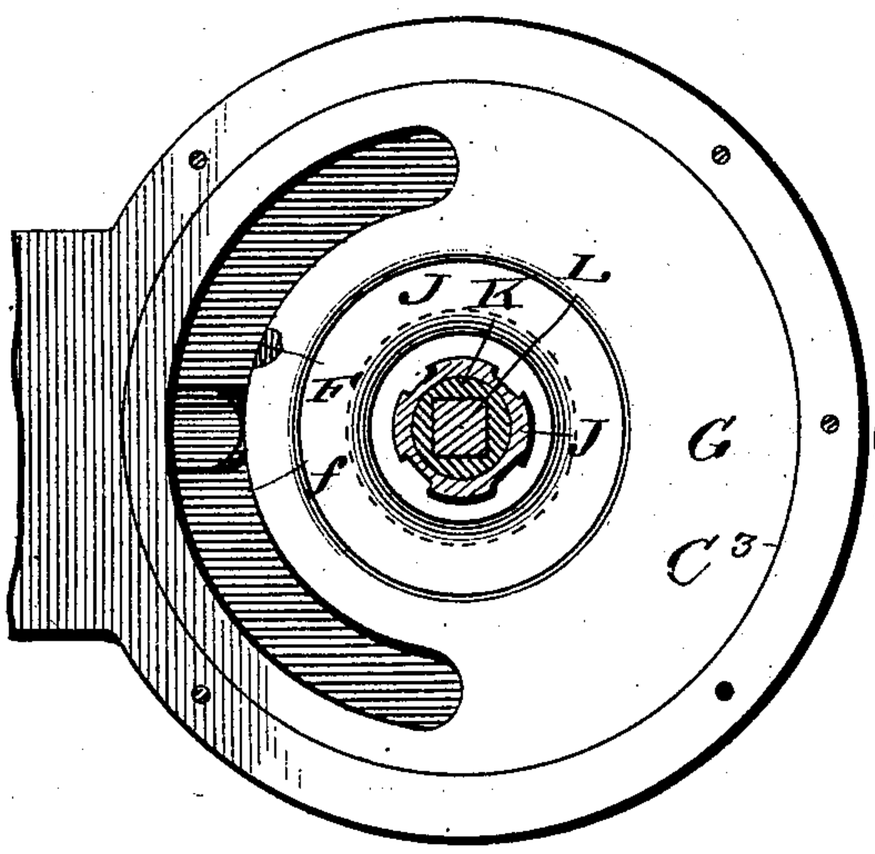


Fig. 6.

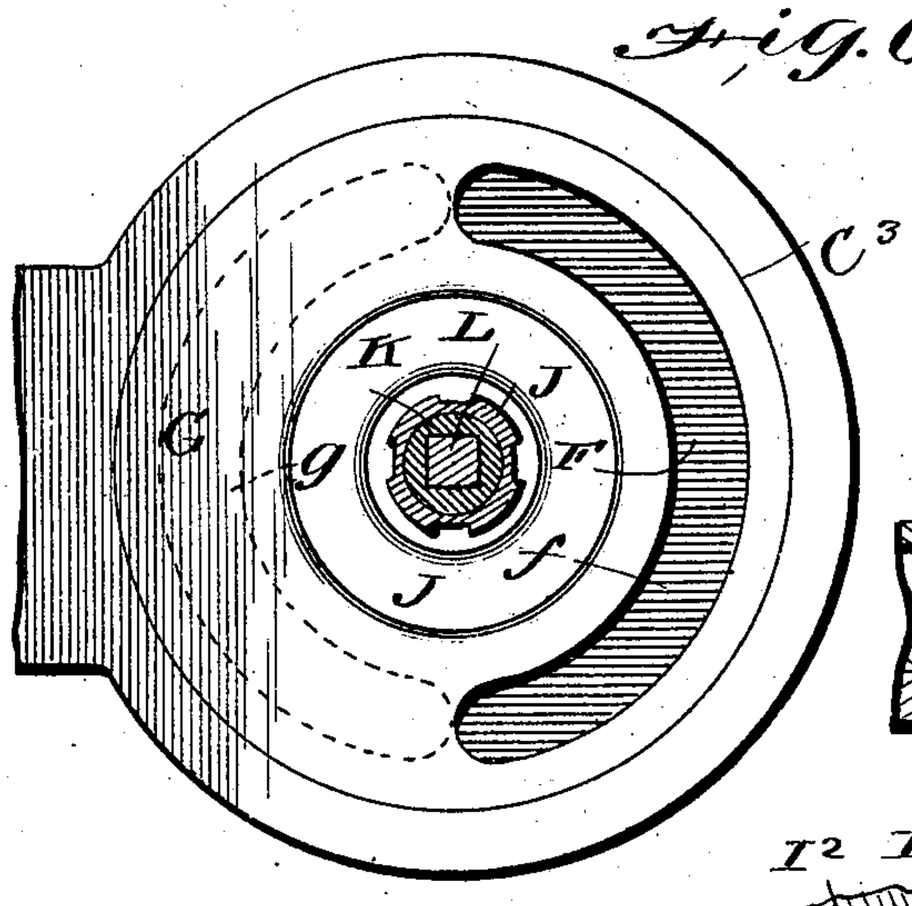
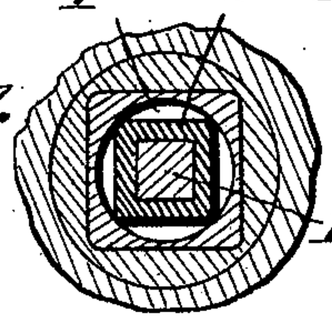


Fig. 7.



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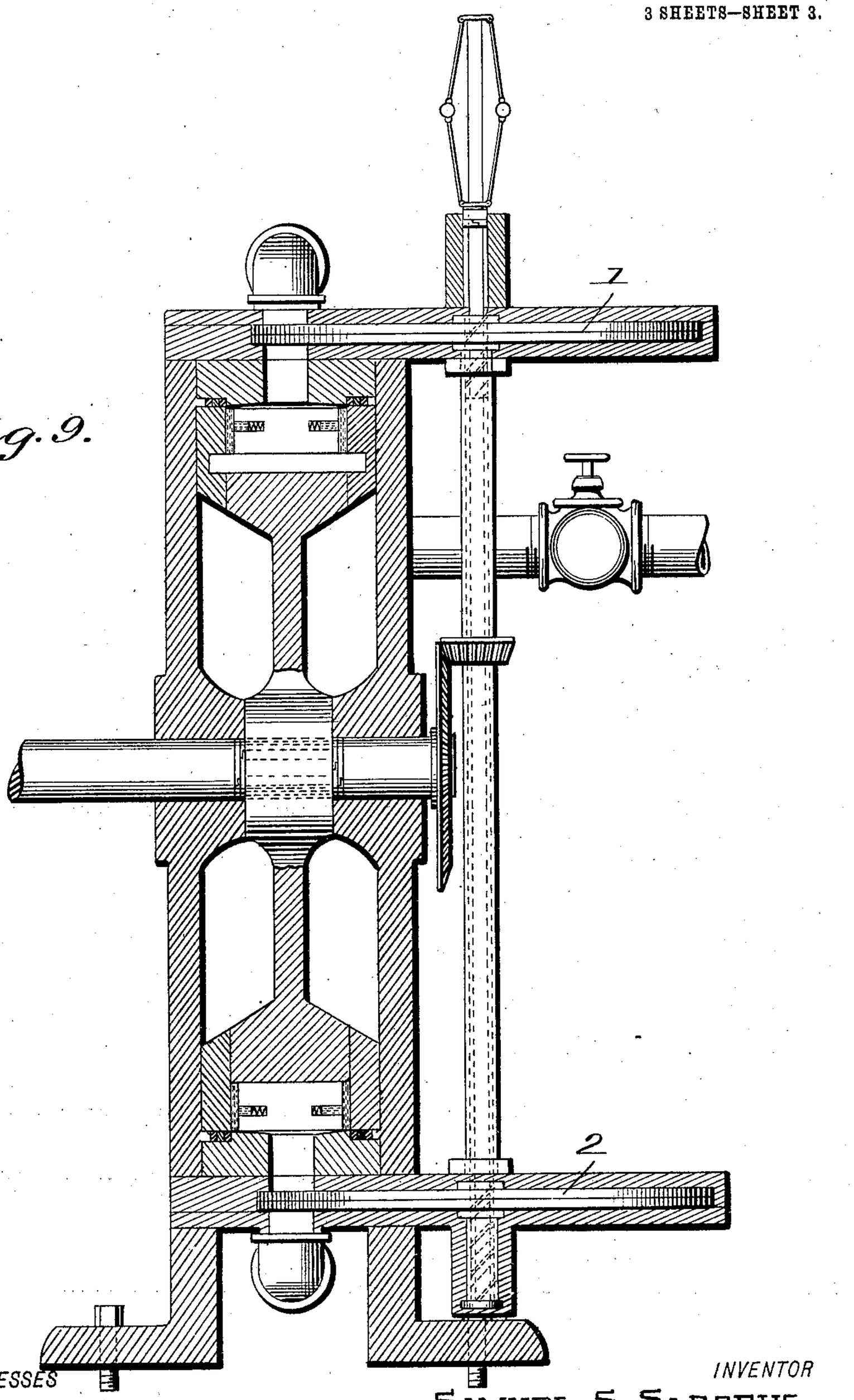
3 SHEETS—SHEET 3.

Fig. 9.



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UNITED STATES PATENT OFFICE.

SAMUEL S. SADORUS, OF SARILDA, IDAHO.

ROTARY ENGINE.

No. 865,804. Specification of Letters Patent. Patented Sept. 10, 1907.

Application filed April 19, 1907. Serial No. 369,124.

To all whom it may concern:

Be it known that I, SAMUEL S. SADORUS, a citizen of the United States, and a resident of Sarilda, in the county of Fremont and State of Idaho, have invented an Improvement in Rotary Engines, of which the following is a specification.

My invention is an improvement in rotary engines, and consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings, Figure 1 is a side view, and Fig. 2 is a vertical cross section on about line 2—2 of Fig. 1. Fig. 3 is a detail sectional view showing one of the abutments in connection with one of the plates of the piston. Fig. 4 is an enlarged section partly broken away showing the valve mechanism and drawn on the same line as Fig. 2. Fig. 5 is a detail cross section on about line 5—5 of Fig. 2. Fig. 6 is a detail cross section on about line 6—6 of Fig. 4. Fig. 7 is a cross section on about line 7—7 of Fig. 4. Fig. 8 is a detail view illustrating the connection between the valve plates and the means for operating and adjusting the same. Fig. 9 is a sectional view showing a somewhat different construction whereby to especially adapt the engine for use with gasolene.

The engine piston A and the abutments B within the casing C may be substantially like those shown in my former patent No. 838,460, dated December 11, 1906. In my present engine, I employ a steam pipe D having branches D′ and D² for conducting the steam to the diametrically opposite inlets *d′* and *e′*. The pipe D may have a suitable throttle *d*, and valves are provided for cutting off the steam at the inlets so that after the steam has been admitted to the casing the supply of steam may be cut off so that the steam which has been admitted can operate expansively, thus securing the benefit of the expansion of the steam, and I also make the cut-off valves in two parts in the form of disks overlying each other and having openings which may be adjusted into full register or partially out of register in order to control the amount of steam fed to the engine, and I adjust these valve plates relatively by mechanism which will be presently described, operated from the piston of the machine, so that the feed of steam may be regulated by the speed of the engine.

As shown, the casing C is provided with lateral wings C′ and C², whose faces are recessed at C³ and C⁴ to receive the cut-off valves, and cover plates C⁵ and C⁶ are fitted to the lateral wings to properly hold the cut-off valves in the use of the invention.

The cut-off valves are constructed alike and consist each of what for convenience of reference I call the main plates F and F′, and the cover plates G and G′, said plates being concentric and having openings *f*, *g*, and *f′*, *g′*, which in the pairs of plates of the same valve may be adjusted into full register, or partially, or entirely, out of register by the operation of the devices presently described, said disks operating across their respective inlets *e′* and *d′*, and the openings in the valve plates being in position to register at intervals with the said inlets, as will be understood from the drawings.

The cut-off valves are operated from the main shaft H of the engine through the gear H′ and the pinion H², the latter being secured upon the shaft I, whereby the cut-off valve will be operated in correspondence to the speed of the engine, as more fully described hereinafter.

The valve shaft I is made in sections fitting one within the other, the main section I′ being tubular and having its bore enlarged at its ends at I² and I³ to receive the spiral sleeves J and J′, which are mounted upon the tube K which is movable longitudinally within the main section I′ of the shaft I, and has a square or other non-circular bore in which fits the rod L, which forms a connection for the governor arms to enable the operation of the tube K which carries the spiral sleeves, as more fully described hereinafter. The main valve sections F and F′ are keyed upon the ends of the main shaft section I′ in the manner best illustrated in Fig. 8, in which the said valve plates are shown as having central rectangular openings fitting over correspondingly angular portions at the ends of the shaft section K, so that these valve plates F and G turn positively with the shaft section I′ and have no turning movement independent of the said shaft. The tube J it will be noticed is keyed within the shaft section I′, so it turns therewith but may move longitudinally within the shaft section I′, and it is provided at its ends with the spiral portions J and J′, which turning in spiral bearings in the valve plates G and G′, operate to give the said valve plates G and G′ a turning movement independent of the revolution of said plates with their mating valve plates F and F′, which latter turn only with the shaft section I′. For convenience in assembling the parts, the spiral portion J′ may be integral with the lower end of the tube K or suitably secured thereto, and the upper end of the tube K is preferably threaded as best shown in Figs. 2 and 4, and the spiral portion J is screwed down thereon to proper position, so it may operate within the threaded bearing of the valve plate G in the use of the invention. A governor is provided for moving the tube K longitudinally within the shaft section I′, in correspondence to the speed of the engine. As shown, the governor has balls M connected by arms M′ with the upper end of the tube K through the medium of the threaded portion J, and also having arms M² connected with a suitable support, shown as the rod L extending through the valve operating shaft and suitably stepped at its lower end as shown in Fig. 2.

In the operation of the described construction, it will be noticed that as the engine begins to speed, the

balls M moving outwardly under the impulse of the speed of the engine, will tend to lift the tube K within the valve operating shaft, and through the spirals on the portions J and J′ shift the valve plates G and G′ relatively to their respective valve plates F and F′, in such manner as to control and regulate the passage of steam to the engine, and cause the same to slow down, and as the engine slows down, the governor will permit the parts to readjust to feed more steam until the desired balance is secured, which will be maintained in the operation of the engine.

In Fig. 9, the disks 1 and 2 are made to reach to the steam inlets as shown in the said figure, so that in case it is desired to use the engine with gasolene, the disks may be arranged to revolve just outside of the space for the operation of the fluid power in order that the gas may explode in order to secure the desired action of the fluid pressure upon the piston.

I claim:

1. The improvement in rotary engines herein described, comprising the piston and its shaft, a casing having a lateral wing and an inlet, a cover plate fitting over said wing, a cut-off valve turning between said cover plate and wing, and having openings movable into and out of register with the inlet, whereby to admit and cut-off steam, a shaft for operating said cut-off valve and gearing between the said shaft and the piston shaft, substantially as set forth.

2. The combination of the casing, having an inlet, the piston and its shaft, and a lateral extension from the casing, comprising a wing and a cover plate thereon, a cut-off valve operating between the wing and cover plate and having an opening moving in register with the inlet to permit the passage of steam from the inlet to the piston, and intermediate devices between said cut-off valve and the piston shaft, whereby the latter may operate the valve, substantially as set forth.

3. The combination of the casing having an inlet, and a laterally extending wing, a cover plate fitting over said wing, a cut-off valve between the said wing and cover plate, and having an opening near its rim for the passage of steam from the inlet to the piston, a valve shaft keyed to the valve and gearing between said valve shaft and the engine shaft, substantially as set forth.

4. The combination of the casing, having the diametrically opposite inlets and a pipe connecting the same, the piston in the casing, the cut-off valves operating across the inlets and perforated in register therewith, a valve shaft connected with said valves, and gearing between the valve shaft and the engine shaft, substantially as set forth.

5. An engine having a casing, a piston therein, and an inlet for the passage of steam to the piston, combined with a cut-off valve controlling said inlet and composed of a main plate and a shifting plate, a valve shaft for turning the main plate, a spiral shaft engaged with the shifting plate and turning with and movable longitudinally independent of the valve shaft, and a governor for effecting the independent movement of the special shaft whereby to adjust the same relative to the valve shaft, substantially as set forth.

6. The combination in an engine, of the casing having the diametrically opposite inlets, the piston in said casing, the valves controlling said inlets and composed each of two plates, a valve shaft whereby to turn both said plates, a governor whereby to turn one of the plates of each pair independently of the other, whereby it may be adjusted relatively thereto, and means for operating the valve shaft from the piston, substantially as set forth.

7. The combination with the engine casing, a piston and shaft, the casing having the opposite inlets, of valves controlling the inlets and composed each of two plates, a valve shaft driven from the engine shaft and arranged to turn both of the plates of each valve, and a governor operated from the valve shaft, and means operated by the governor whereby to shift one of the plates of each valve relative to its mating plate, substantially as set forth.

8. The combination in an engine, with the casing having the inlets, the piston and the engine shaft, of the valve shaft geared with the engine shaft and having a main section, a tubular section turning with and movable longitudinally within the main section, and provided with spiral portions, a rod within and turning with said tubular portion, a governor connected with said inner rod and the tubular portion, and valves having plates arranged in pairs, one of the plates of each pair being keyed to and turning with the main shaft section, and the other plate of each pair being mounted on and arranged for operation by the spiral portions of the tubular section of the valve shaft, substantially as set forth.

9. A rotary engine having a casing, a piston, and an engine shaft, in combination with a cut-off valve, composed of two plates, a valve shaft geared with the engine shaft and having a fixed relation with one of the valve plates to turn the same positively, a spiral moving within the valve shaft and engaged with the other valve plate to operate the same relatively to that fixed to the valve shaft, and means for automatically shifting the spiral, substantially as set forth.

10. The combination in an engine, with the casing having an inlet, of a valve controlling said inlet and consisting of a main plate, and a shifting plate, a valve shaft held to the main plate for turning the same, and a spiral turning with and movable longitudinally in the valve shaft, and engaged with the shifting plate for adjusting the same relatively to the plate held to the valve shaft, and means for moving the said spiral longitudinally, substantially as set forth.

11. The combination with the engine casing having the opposite inlets, of an engine shaft having a tubular main section, valve plates fitting on the opposite ends of and keyed to said main section, shifting valve plates mating with said first named valve plates, and means for shifting said shifting valve plates, comprising spirals engaging therewith, a connection between said spirals extending through the main shaft section, and a governor for moving said spirals and connecting portion endwise within the main shaft section, substantially as set forth.

SAMUEL S. SADORUS.

Witnesses:
H. G. FULLER,
THERESA S. BRESHEARS.