No. 718,198. PATENTED JAN. 13, 1903.

M. P. ELGEN.

ROTARY ENGINE.

APPLICATION FILED JUNE 5, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 2.

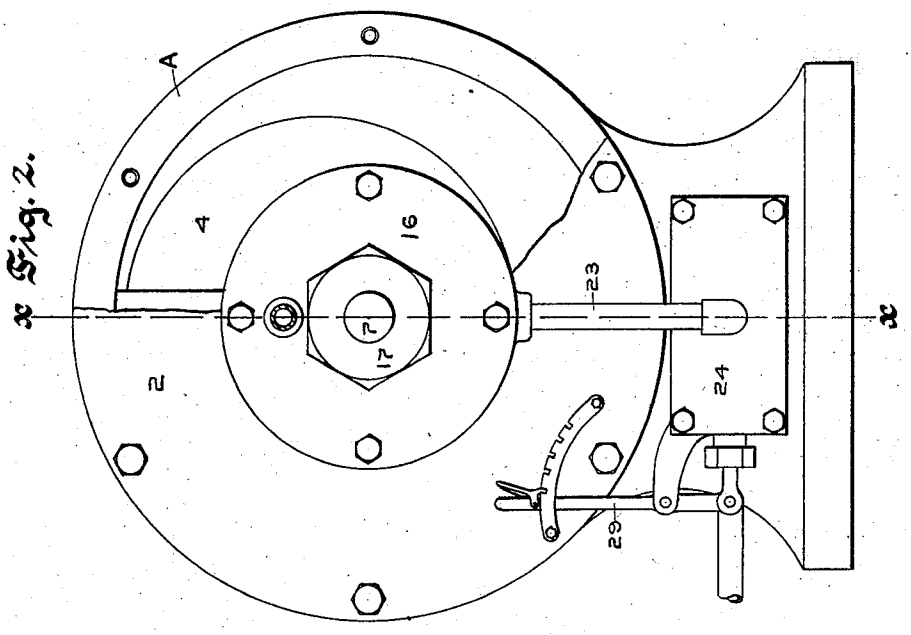
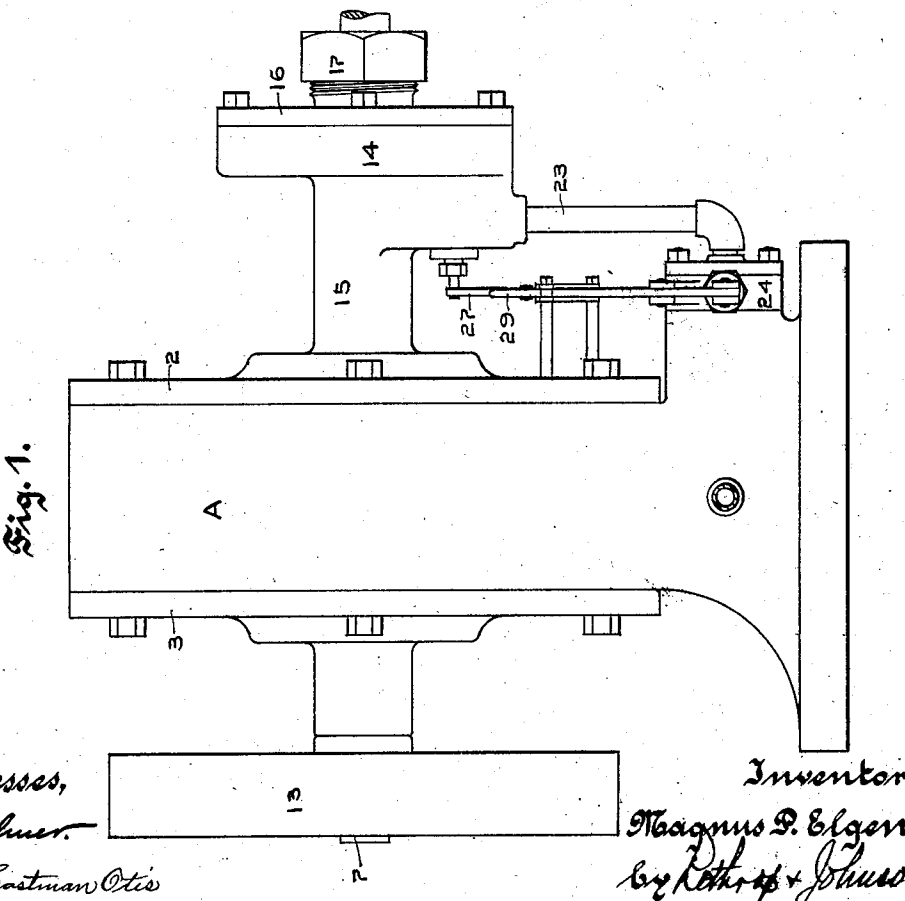


Fig. 1.



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THE, NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

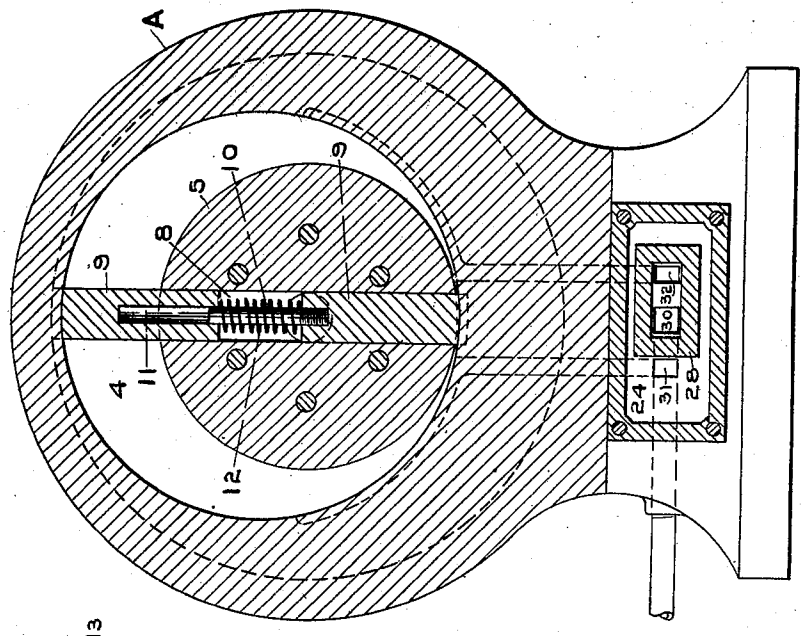
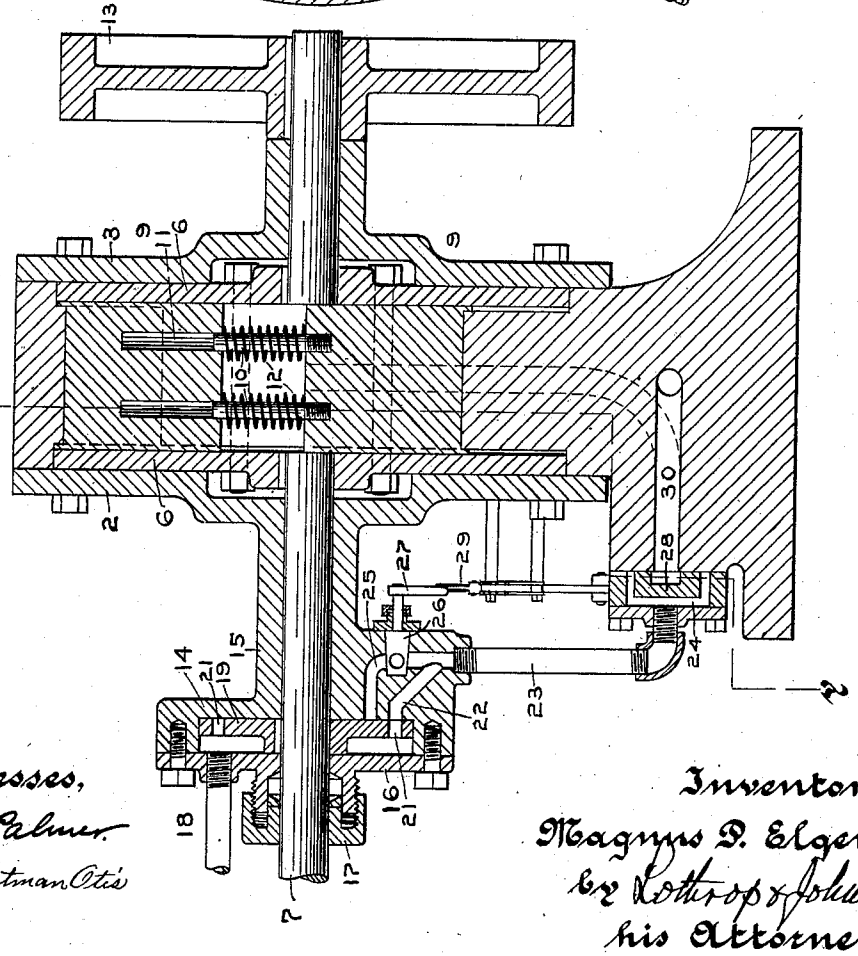


Fig. 3.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5.

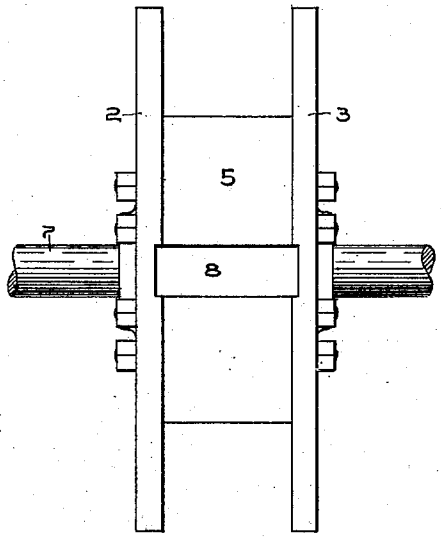


Fig. 6.

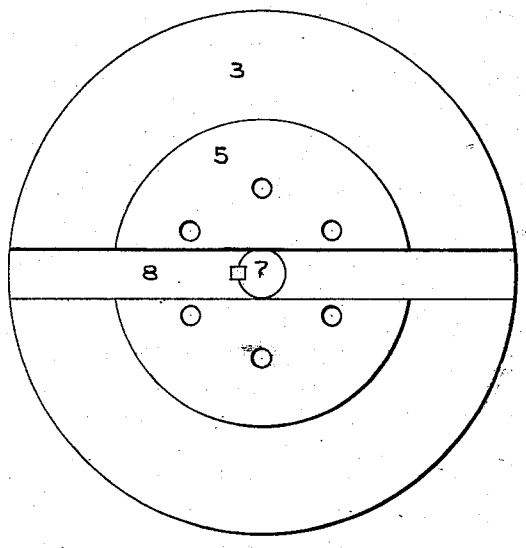


Fig. 7.

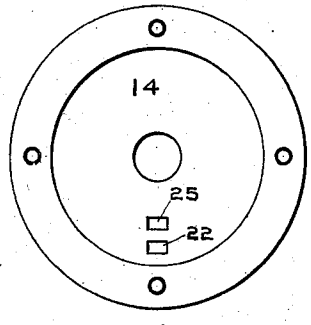


Fig. 8.

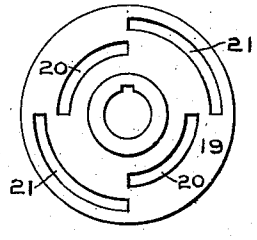
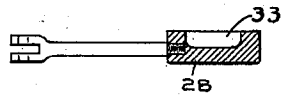


Fig. 9.



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UNITED STATES PATENT OFFICE.

MAGNUS P. ELGEN, OF MASS, MICHIGAN, ASSIGNOR OF ONE-HALF TO CHRIST P. ANDERSON, OF MASS, MICHIGAN.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 718,198, dated January 13, 1903.

Application filed June 5, 1902. Serial No. 110,257. (No model.)

To all whom it may concern:

Be it known that I, MAGNUS P. ELGEN, a citizen of the United States, residing at Mass, in the county of Ontonagon and State of Michigan, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to improvements in rotary engines; and it consists particularly in improved valve mechanism for controlling the inlet and exhaust of steam into and from the cylinder and in other improvements hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of my improved engine. Fig. 2 is a side elevation of the same. Fig. 3 is a section on line $x\ x$ of Fig. 2. Fig. 4 is a section on line $y\ y$ of Fig. 3. Figs. 5 and 6 are views of the piston-cylinder and connected parts. Fig. 7 is a view of the steam-chest with the cover and valve removed. Fig. 8 is a detail of the steam-chest, and Fig. 9 is a longitudinal section of the reverse-valve.

In the drawings, A represents the cylindrical wall of the engine, and 2 and 3 the end walls, forming an inner chamber 4. Within the chamber 4 is eccentrically arranged the piston-cylinder 5, secured between the plates 6, to which plates is connected the main shaft 7. The plates 6 fit into the cylindrical wall of the chamber, as shown in Fig. 3. Arranged in a transverse opening 8 in the piston-cylinder are the wings 9, connected by a rod 10, threaded in one of the wings 9 and projecting into an opening 11 in the other wing, said wings being normally held separated by a spring 12, surrounding the rod. Mounted upon one end of the main shaft 7 is a fly-wheel 13, the end of the shaft 7 upon the opposite side of the engine being surrounded by the steam-chest 14, said steam-chest being formed in the extension 15 of the adjacent side wall of the engine. The steam-chest 14 is closed by a cap 16, provided with a stuffing-box 17, through which the shaft 7 passes. An inlet steam-pipe 18 opens through the cap 16 into the steam-chest. Secured upon the main shaft within the steam-chest is the valve 19, provided with two pairs of ports 20 and 21, respectively. The outer ports 21 are adapted to register in the operation of the machine with the port 22, connecting with a pipe 23, which opens into the reversing-valve chest 24. The inner ports 20 similarly register with a port 25, connected with the pipe 23. Arranged in the port 25 is the by-pass valve 26, provided with an operating-handle 27. Within the valve-chamber 24 is arranged a slide-valve 28, provided with an actuating-handle 29. The valve 28 cooperates with the exhaust-port 30 and with ports 31 and 32, leading to the piston-chamber, the chamber ends of the ports 31 and 32 extending along the inner wall of the chamber, as illustrated in Fig. 4. The valve 28 is formed with a cut-away portion 33 in its inner side, adapted to connect either the port 31 or the port 32 with the exhaust-port 30, as shown in Fig. 4.

With the parts arranged as shown in the drawings steam may be admitted through the inlet-pipe 18, passing through the ports 21 of the valve 19, through the pipe 23, and through the port 31 to the piston-chamber to act upon one of the wings 9 and rotate the piston-cylinder. The steam will thereafter pass from the piston-chamber through the port 32 and valve 28 to the exhaust-port. By referring to Fig. 8 it will be seen that the steam will be admitted during one-quarter stroke for each of the ports 21. By opening the by-pass valve 26 the steam will also be admitted through the ports 20 while the ports 21 are closed, thus giving a continuous inflow of steam into the piston-chamber. The operation of the engine may be reversed by sliding the valve 28 to connect the exhaust-port 30 with either one of the valves 31 or 32.

I claim—

1. In a rotary engine of the class described, the combination with the piston-chamber, a piston-cylinder supported therein and a shaft carried by said cylinder, of a steam-chest surrounding said shaft, an inlet steam-port for said chest, a pair of outlet-ports connecting said chest with the piston-chamber, a by-pass valve located in one of said ports, and a cut-off valve arranged in said steam-chest, said valve being mounted upon said shaft and

provided with ports adapted to be brought into registering position with said outlet-ports.

2. In a rotary engine of the class described, the combination with the piston-chamber, a piston-cylinder supported in said chamber, and a shaft carried thereby, of a steam-chest surrounding said shaft, said steam-chest being provided with outlet-ports leading to a reverse-valve chest, a cut-off valve arranged in said steam-chest and carried by said shaft, and a slidable valve arranged in said reverse-valve chest, said valve coöperating with a pair of ports leading to the piston-chamber and with an intermediate exhaust-port.

3. In a rotary engine of the class described, the combination with the piston-chamber, a piston-cylinder arranged therein, and a shaft carried by said cylinder, of a steam-chest surrounding said shaft, said steam-chest being provided with an inlet-port and with a pair of outlet-ports leading to a reverse-valve chest, a rotary valve carried by said shaft and provided with ports adapted to coöperate with the outlet-ports of said steam-chest, a valve arranged in said reverse-valve chest and adapted to be actuated to connect one of a pair of ports leading to the piston-chamber, a steam-chest surrounding the cylinder-shaft, said chest being provided with an inlet-port, and with a pair of outlet-ports leading to a reverse-valve chest, a by-pass valve arranged in one of said outlet-ports, a rotary cut-off valve carried by said shaft and provided with ports adapted to be brought into registering position with said outlet-ports in the turning of said shaft, a valve arranged in said reverse-valve chest, and means for actuating said valve to connect said valve-chest with a port leading to the piston-chamber and to connect a similar port with an exhaust-port.

4. In a rotary engine of the class described, the combination with the piston-chamber, a piston-cylinder supported therein and a shaft carried by said cylinder, of plates secured to the opposite ends of said cylinder and projecting into grooves in the wall of the piston-chamber, a steam-chest surrounding said shaft, said steam-chest being provided with an inlet-port and with a pair of outlet-ports connected with a reverse-valve chest, a rotary cut-off valve arranged in said steam-chest, said valve being mounted upon said shaft and being provided with ports adapted to be brought into registering position with said outlet-ports in the rotation of said shaft, a by-pass valve arranged in one of said outlet-ports, a slide-valve arranged in said reverse-valve chest, and means for actuating said valve to connect said valve-chest with a port leading to the piston-chamber and to connect a similar port with an exhaust-port.

In testimony whereof I affix my signature in presence of two witnesses.

MAGNUS P. ELGEN.

Witnesses:
W. C. MANNIS,
M. R. MULLEN.