

No. 712,709.

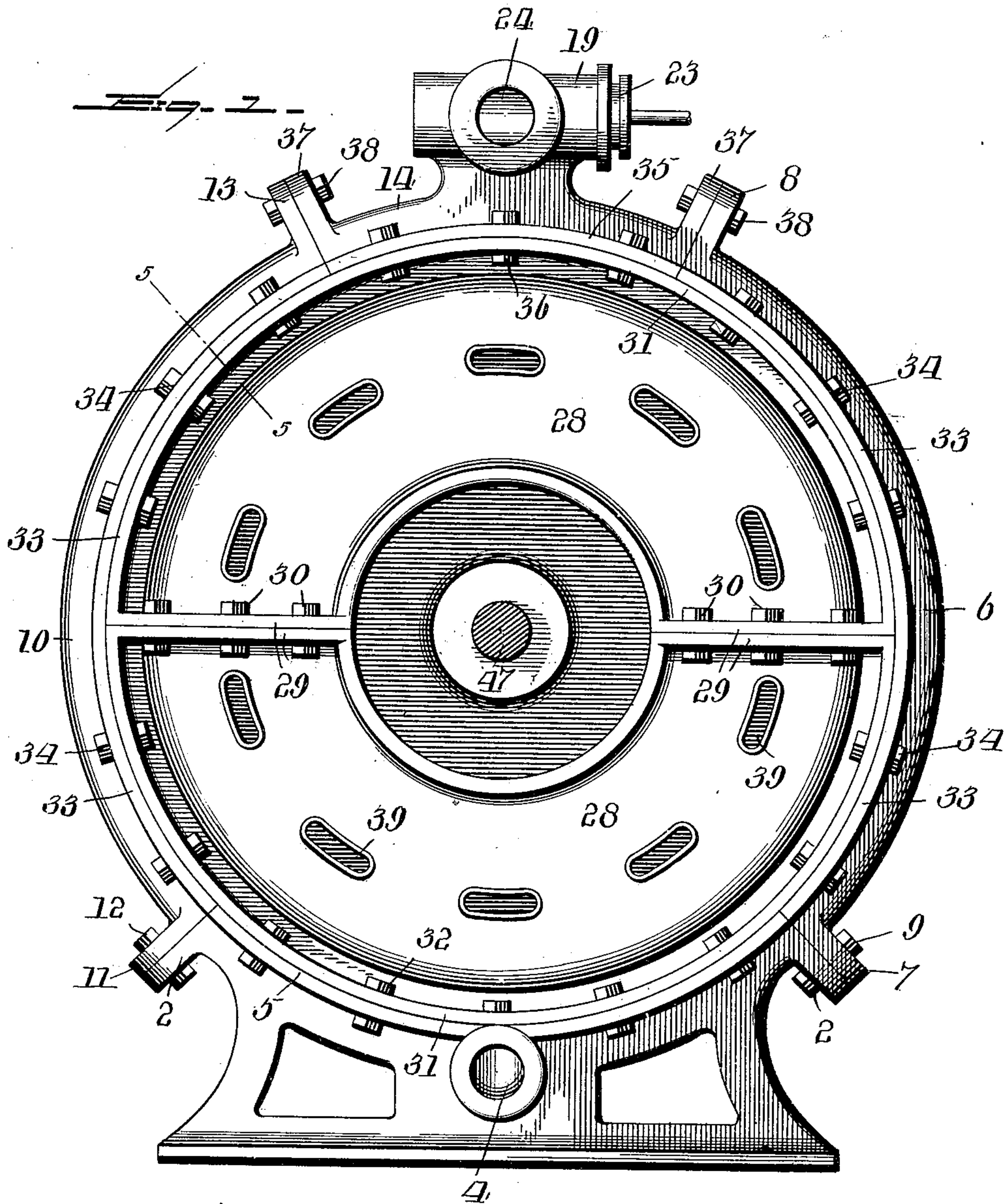
Patented Nov. 4, 1902.

R. MCGREGOR.  
ROTARY ENGINE.

(Application filed Dec. 7, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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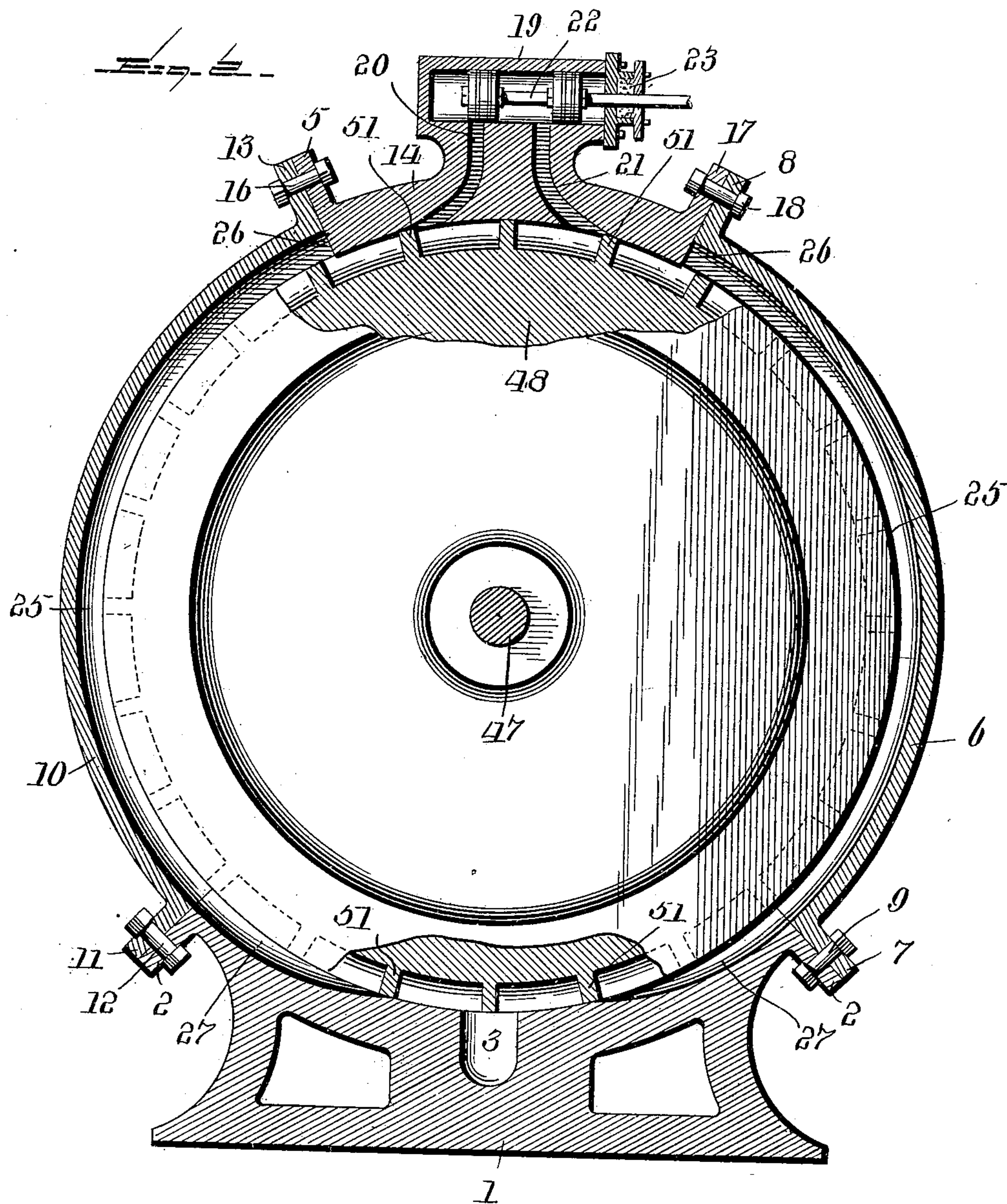
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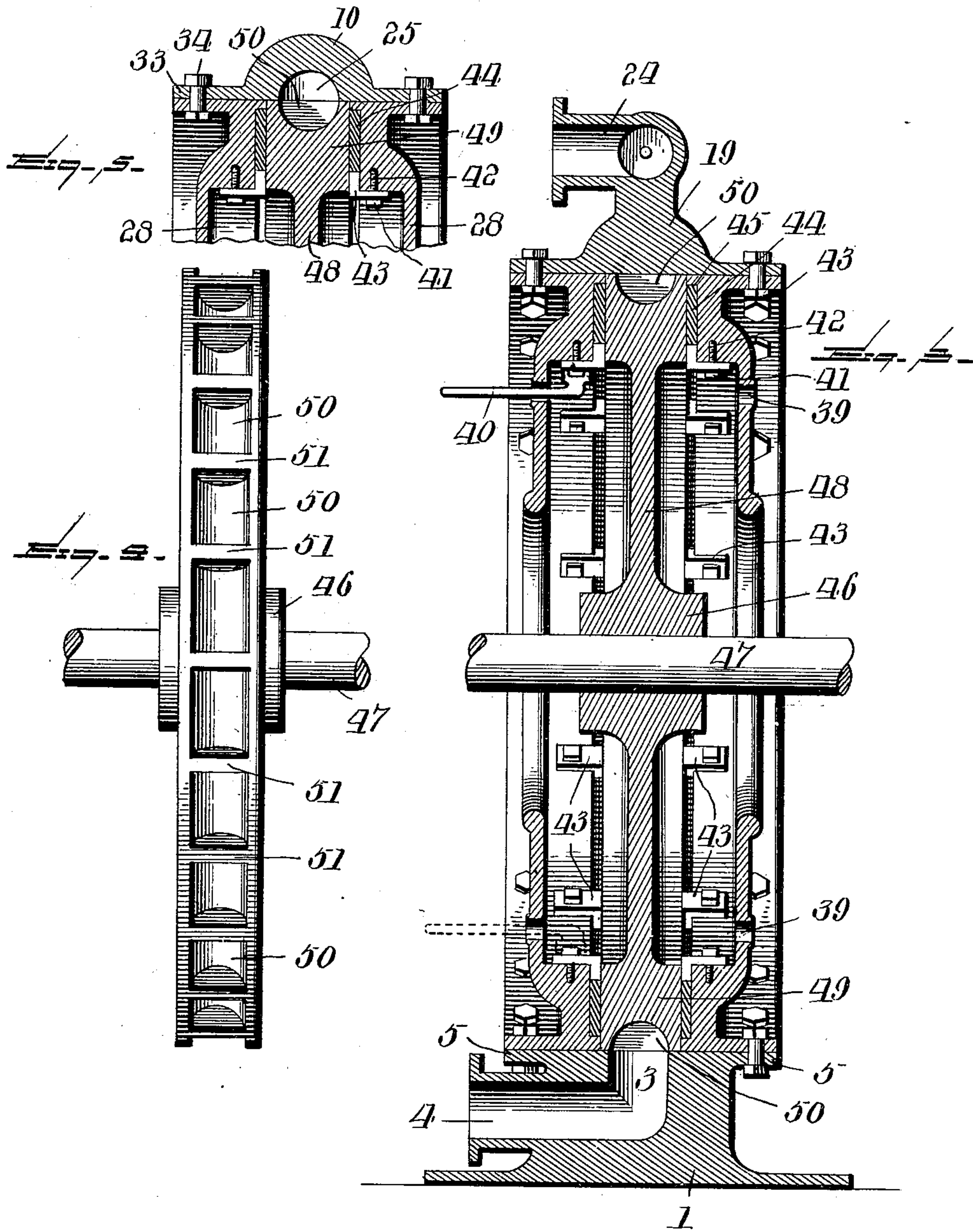
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# UNITED STATES PATENT OFFICE.

ROBERT MCGREGOR, OF NEW YORK, N. Y.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 712,709, dated November 4, 1902.

Application filed December 7, 1901. Serial No. 85,085. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT MCGREGOR, a citizen of the United States, residing at New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in rotary engines; and it has for its object, among others, to provide a simple, cheap, and improved construction of an engine which can be placed on the shafts of vessels with the present style of engine by simply uncoupling the present style and placing my engine on the same shaft, making the same, preferably, as large in diameter as can be disposed between the floor and the center of the shaft. Three engines on a shaft will give greater power with less steam and consequently less fuel.

I provide efficient means for permitting access to the means for adjusting the gland of the stuffing-box when required. Further, I provide a sectional casing and simple means for effecting a cut off at the proper points. I admit the motive power upon one side and exhaust at the diametrically opposite side of the cylinder, the exhaust-port being formed in the base and the inlet-ports being formed in a casting at the opposite side of the cylinder. The valve-chest is formed upon this casting and receives the reciprocating valve. The rotary piston is formed with a series of concaves or pockets, one between each two cross-bars or partitions, which cross-bars or partitions act as cut-offs.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an end view of my improved engine, with the shaft shown in section. Fig. 2 is a substantially vertical section through the same, with a part in elevation, with portions

broken away. Fig. 3 is a vertical section taken at right angles to Fig. 2. Fig. 4 is a face view of the rotary piston removed from the cylinder. Fig. 5 is a sectional detail on the line 5 5 of Fig. 1.

Like numerals of reference indicate like parts throughout the several views.

Referring now to the drawings, 1 designates the base, having flanges 2, providing for its attachment to the flanges of the adjacent portions of the casting. This base is provided with the exhaust-passage 3, which, as seen best in Fig. 3, connects with the port 4, which may lead to any desired point. This base is further provided with the horizontal flanges 5, adapted to cooperate with a like flange on the end of the casing, as will hereinafter appear.

6 designates one section of the casing, having the flanges 7 and 8, the former of which coincides with the flange 2 upon one side of the case, and the same are secured together by the bolts 9. 10 is another section of the casing, having at its lower end a flange 11, coinciding with the adjacent flange 2 of the base, the two being secured together by bolts 12. This section 10 of the casing is provided at its other end with a flange 13, as seen clearly in Figs. 1 and 2.

14 is a casting at the upper end of the cylinder, having flange 15, coinciding with the flange 13, the two flanges being secured by a bolt 16. At the opposite side this casting is formed with the flange 17, coinciding with the flange 8 of the section 6 and the two flanges secured together by a bolt 18. This casting is formed with the valve-chest 19, from which extend the ports or passage-ways 20 and 21, as seen in Fig. 2, and in this valve-chest works the double valve 22, the stem of which works through a suitable stuffing-box 23, the said valve being designed to be operated in any well-known manner from the pilot-house or any other desired point. Steam is admitted through the steam-inlet 24, adapted to be connected with any suitable source of supply.

The inner walls or portions of the section 6 and 10 are provided with the semicircular passage-ways 25. (Seen best in Figs. 2 and 5.) At the upper end these passage-ways are



closed by the abutments 26, formed by the ends of the casting 14, as seen clearly in Fig. 2.

At the lower ends these passages 25 connect with the passages 27, formed in the inner walls of the base at the top. These passages are tapered or inclined, as seen best in Fig. 2, so as to terminate at a distance from the exhaust-port.

The ends 28 of the cylinder are formed each in two parts, as seen best in Fig. 1, being provided at points diametrically opposite and in line with the shaft with flanges 29, through which pass the bolts 30, by which they are firmly yet detachably secured together. These sections are further provided with flanges 31, which coincide with the flanges 5 of the base and are secured by the bolts 32 and further with flanges 33 of the sections 6 and 10, the same being secured together by bolts 34. The upper section has its flange 31 coinciding with the flange 35 of the casting 14, the two being secured together by the bolts 36. The casting 14 is further provided with flanges 37, which are secured to the flanges 8 and 13 by bolts 38. It will thus be seen that I have provided a sectional cylinder or a casing the parts of which may be readily assembled or separated when desired and broken parts readily replaced by new ones or repaired and then placed in position again. The ends of the cylinder are provided with openings 39, through which may be inserted a wrench 40, as shown in Fig. 3, to engage the nuts or heads 41 of the bolts 42, which pass through the flanged plates 43 to adjust the packing 44, which is interposed between the inner faces of the ends or heads of the cylinder and the adjacent faces of the piston, as seen clearly in Fig. 3, to form tight joints. The packing devices 44 are seated in recesses 45, formed in the inner faces of the heads or ends of the cylinder adjacent to the periphery of the same.

The piston comprises a hub 46, through which passes the shaft 47 and the web 48, the periphery of which is enlarged, as shown at 49, and is provided with a plurality of semicircular pockets 50. The partitions or cross-bars 51 between the pockets form cut-offs, as will be apparent.

With the parts constructed and arranged substantially as hereinbefore described the operation will be apparent and, briefly stated, is as follows: Steam is admitted through the port 21 and acting against the cross-bars or blades of the piston forces the same in the direction of the arrow in Fig. 2, the steam expanding into the passage 25 and the cross-bars 51 serving as cut-offs when they reach the smooth uncurved portion of the base, as seen in Fig. 2, and exhausting through the exhaust 3. A slight movement of the valve will open the port 20 and close the port 21, when steam will enter through the port 20 and acting upon the piston will reverse the motion of the engine, as will be readily understood. The valve may be readily moved,

so as to close both ports 20 and 21 and quickly stop the engine. A further movement will reverse the engine.

It will be seen from the above that I have devised a simple, cheap, yet durable rotary engine composed of few parts, those capable of manufacture at minimum cost, and the device as a whole capable of propelling a vessel at greatly-accelerated speed, and while the structural embodiment of the invention as herein disclosed is what at the present time I consider preferable it is evident that changes, variations, and modifications may be made without departing from the spirit of the invention or sacrificing any of its advantages. I therefore do not wish to restrict myself to the details of construction herein disclosed, but reserve the right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

What I claim is known as—

1. A rotary engine comprising a cylinder, a separately-formed base, a separately-formed top casting, a rotary piston in said cylinder, an inlet at one side in said casting, and an exhaust in said base at the diametrically opposite side of the cylinder, substantially as described.

2. A rotary engine comprising a sectional cylinder and separately-formed base with exhaust-passage, and a top casting with inlet-ports and a valve in said casting controlling such ports, and a rotary piston in said cylinder having pockets separated by cross-bars.

3. A rotary engine comprising a sectional cylinder and separately-formed base with exhaust-port, and a casting at the top of the cylinder having inlet-ports and valve-chest and the ends of which form abutments, means for securing said parts together, and a rotary piston in said cylinder.

4. A rotary engine comprising a sectional cylinder having semicircular passages with a casting having inlet-ports, said casting forming abutments closing the adjacent ends of said passages, and a rotary piston having pockets separated by cross-bars.

5. In a rotary engine a cylinder provided with angle-irons and having heads with openings providing access to the means for adjusting the packing and a piston in said cylinder.

6. In a rotary engine angle-irons and packing held thereby a sectional cylinder having sectional heads provided with openings permitting access to the adjusting devices of the packing, and means for securing said heads and cylinder-sections together and a piston in said cylinder.

7. In a rotary engine, a base having exhaust-ports and tapered passages and cylinder-sections having passages coinciding therewith and means for detachably securing said sections and base together and a rotary piston with pockets revolubly mounted in said cylinder.

8. In a rotary engine, a sectional cylinder having passage-ways and base having coin-



5 ciding tapered passages, and a casting forming the top of the cylinder and having portions forming abutments in said passages and a rotary piston in said cylinder provided with peripheral pockets.

9. In a rotary engine, a base with exhaust-  
port and tapered passages, side sections detachably secured to the base and having coinciding passages, and the top section detachably secured to the side sections and having inlet-ports and portions forming abutments in the side passages and a rotary piston in said cylinder having peripheral pockets.

10. In a rotary engine, a base with exhaust-  
15 port and tapered passages, side sections de-

tachably secured to the base and having coinciding passages, and the top section detachably secured to the side sections and having inlet-ports and portions forming abutments in the side passages, said top section being 20 formed with an integral valve-chest and a rotary piston having pockets and revolubly mounted in said cylinder.

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

ROBERT MCGREGOR. [L. S.]

Witnesses:

ROBERT D. MCGREGOR, Jr.,  
JEREMIAH P. APPLGATE.