(No Model.) 2 Sheets—Sheet 1.

J. H. PARSONS.

ROTARY ENGINE.

No. 605,906. Patented June 21, 1898.

Fig. 1.

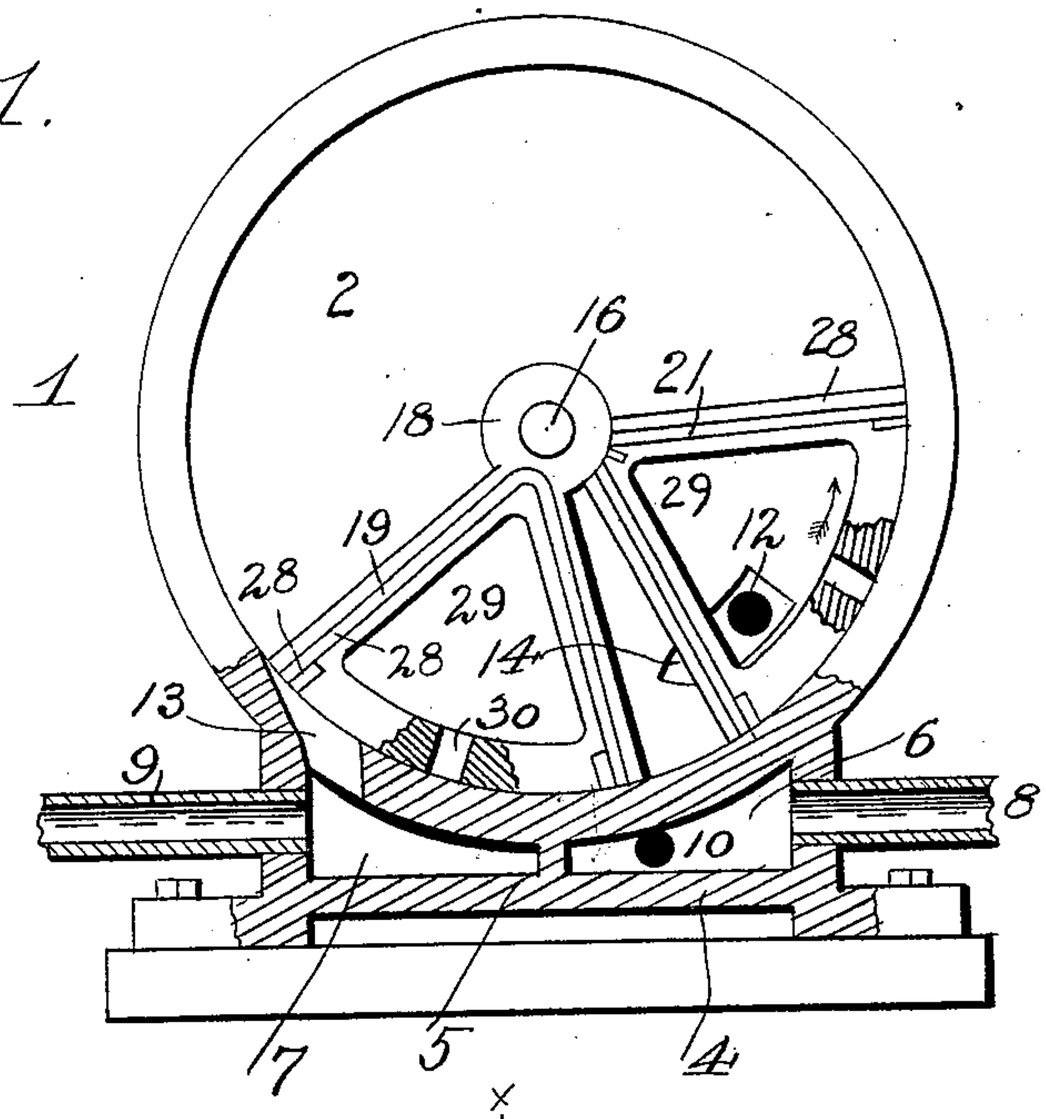

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

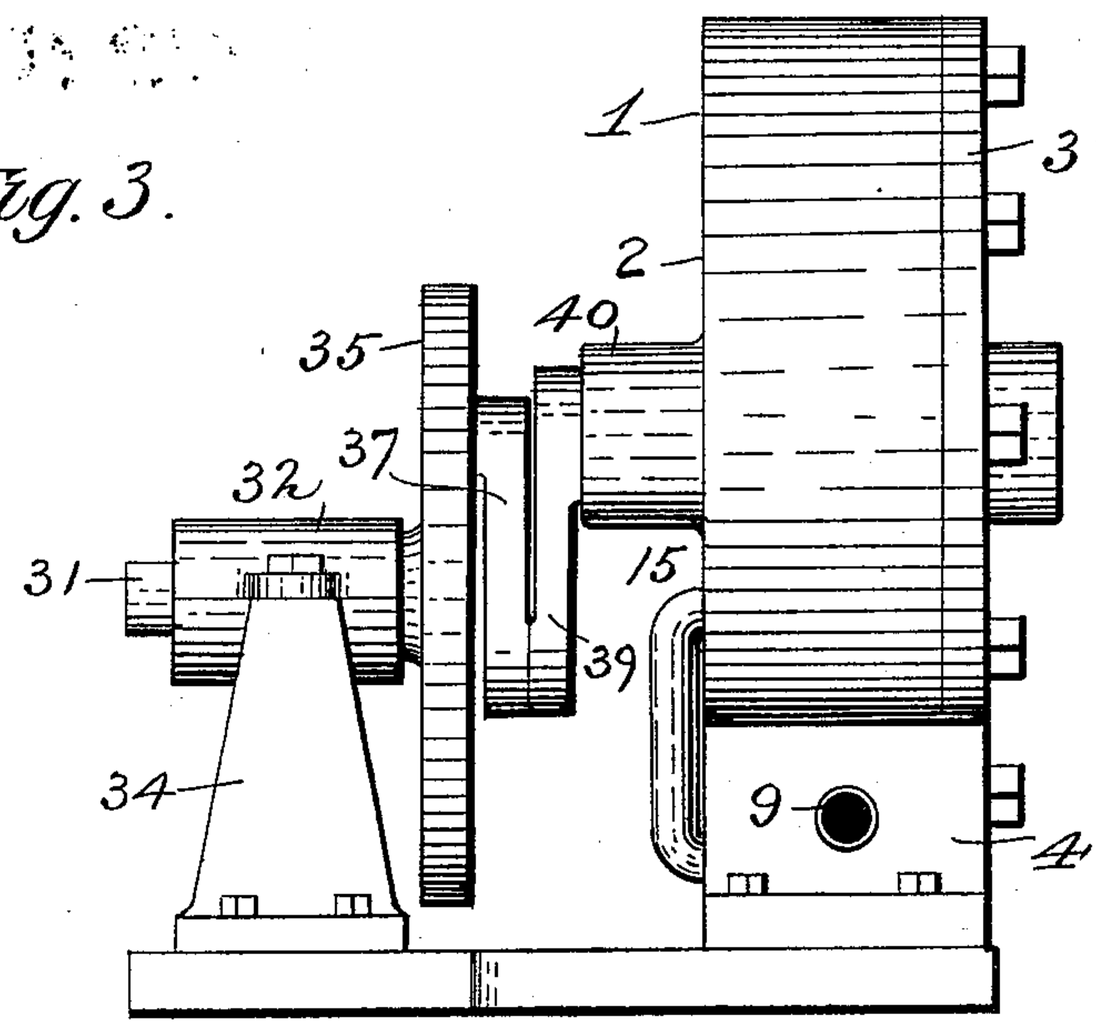


Fig. 4.

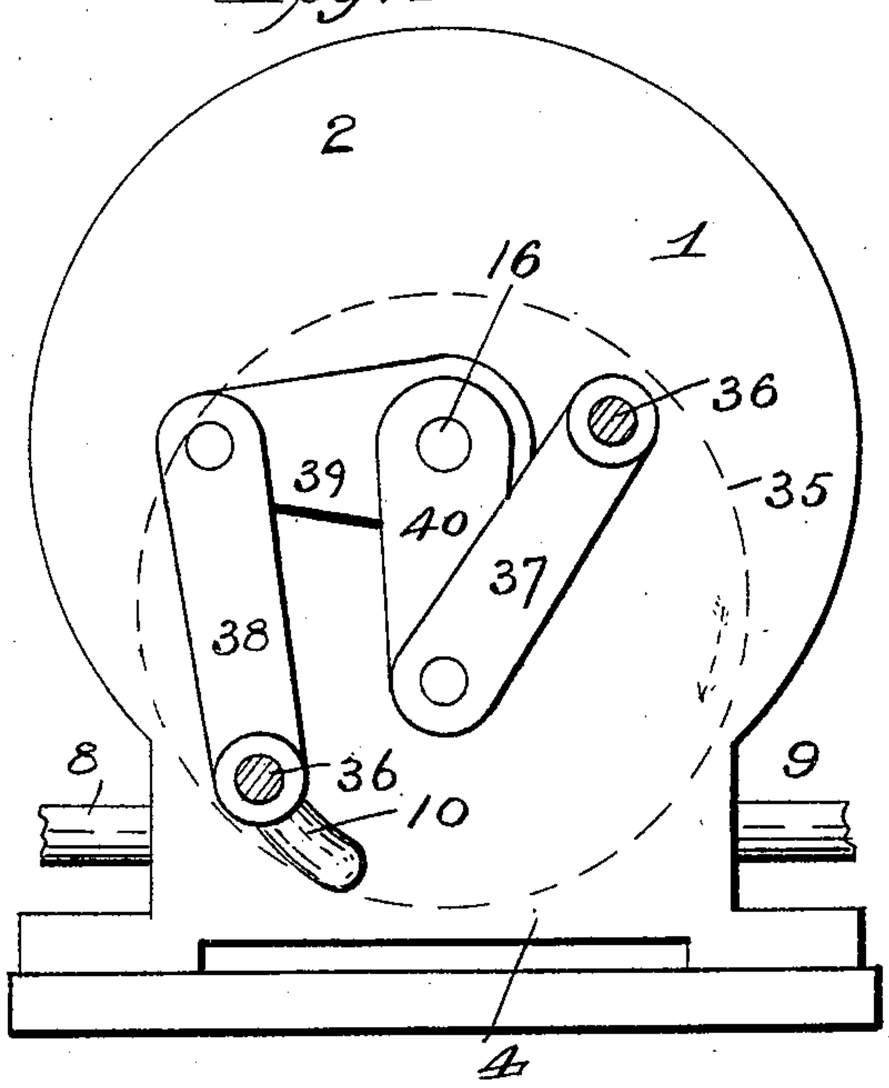
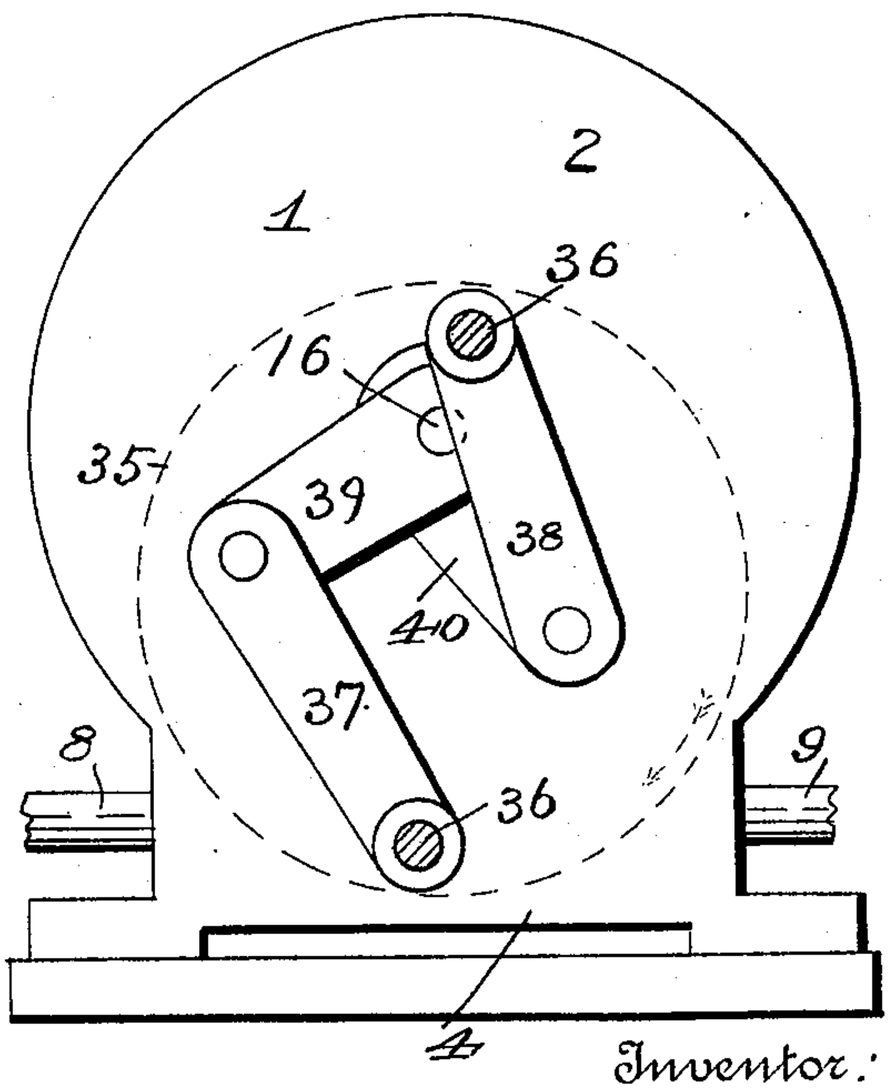


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN H. PARSONS, OF WILMINGTON, DELAWARE, ASSIGNOR OF ONE-HALF TO CHARLES WILMER GOODING, ALFRED D. WARNER, AND CHARLES WARNER, JR., OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 605,906, dated June 21, 1898.

Application filed August 3, 1897. Serial No. 646,856. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PARSONS, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, 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.

My invention relates to alternating-piston rotary engines which comprise in their structure a stationary cylinder, two continuously-rotatable pistons provided with cranks, and links so connected with a wheel or disk secured to an eccentric driving-shaft that said pistons will be alternately rotated at variable speeds.

The object of the invention is to provide an improved construction of rotary engine which shall possess superior advantages with respect to efficiency in operation.

The invention consists in the novel construction and combination of parts, as hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a rotary engine constructed in accordance with my invention, the cylinder-head being removed to show the pistons and the piston-rims partly broken away to show the openings therein. Fig. 2 is a plan view of the same, partly in horizontal section. Fig. 3 is a side elevation. Fig. 4 is a transverse sectional view on the line *x x*, Fig. 2. Fig. 5 is a similar view showing the cranks and links in different positions.

In the said drawings the reference-numeral 1 designates the cylinder, provided with heads 2 and 3, the inner head 2 being preferably cast integral therewith, while the outer one, 3, is bolted to the cylinder. Also formed with said cylinder is a hollow base 4, divided by a central partition 5 into an inlet steam-chamber 6 and an exhaust-chamber 7, provided with inlet and exhaust pipes 8 and 9. The inlet-chamber communicates with a steam-passage 10, which in turn communicates with an inlet-opening 12 in the inner side of the cylinder-head 2. The exhaust-chamber communicates with an exhaust-opening 13 in the cylinder. It will be seen that the inlet-opening 12 is contracted, as seen at 14, Fig. 1, for a purpose hereinafter described.

The head 2 of the cylinder is provided with a boss 15, through which passes a shaft 16, on which is journaled a sleeve 17, both of which are rotatable independently of each other. Secured to the said shaft is the hub 18 of a piston 19, while secured to or formed integral with the sleeve is a similar hub 20 of a piston 21. These hubs at their adjoining ends are cut away for about one-half of their length, so that the inner ends of the piston will overlap the same.

Formed centrally in the removable head of the cylinder are two recesses 23 and 24, with which the shaft 16 and the hub 18, respectively, engage. A washer 25 is interposed between said hub 18 and the cylinder-head, which is pressed against the hub by a spring 26, so as to make a steam-tight joint, while a dowel 27 engages with slots in the cylinder-head and washer to prevent the latter from rotating.

The numeral 28 designates spring-pressed packing-strips inserted in grooves in the pistons. The pistons are made hollow or formed with openings 29, having apertures 30 in the rims. The purpose of these is to counterbalance the pistons against the centrifugal force of the pistons when rotating at a high speed, steam entering the pistons from the inlet-opening and pressing against the rim of the cylinder.

The numeral 31 designates the driving-shaft, eccentric to the cylinder and journaled in bearings 32, supported by a standard 34. Secured to the inner end of this shaft is a wheel or disk 35, provided at diametrically opposite points with wrist-pins 36, to which are journaled links 37 and 38, which in turn are pivoted to cranks 39 and 40, secured to the shaft 16 and sleeve 17, respectively.

The operation is as follows: In the position shown in Fig. 1 steam is admitted between the pistons from the inlet-opening and will force the same in the direction shown by the

arrows, the rear piston acting as an abutment for the front one. The front piston will be rotated rapidly, while the rear one will rotate at about one-fourth the speed thereof, owing to the crank-and-link connections with the disk of the driving-shaft. After the front piston passes the inlet-opening the supply will be cut off and the piston be rotated by expansion. As the said piston nears the end of its stroke the steam-pressure will decrease; but the power exerted on the driving-shaft will not vary, as the leverage of the crank and link will be increased, owing to their change in position. When the piston reaches the exhaust, the other piston will have reached the inlet-opening, when it will become the fast piston and the other piston the slow one. This operation will be kept up continuously as long as steam is supplied to the cylinder, the speed of the two pistons alternately varying. When the piston reaches the exhaust, its crank and link and the driving-shaft wheel or disk will be centered, so as to prevent back movement of the piston, which, as before stated, will serve as an abutment for the steam-pressure, so that the front piston will be rotated. As this latter piston continues its movement the leverage between its crank and link and the driving-shaft disk will be increased, so that the front piston will rotate about four times as fast as the back one, the latter being moved forward after its crank and link pass the center by the movement of the said disk and the connections. There are no valves admitting and exhausting steam and there will be no dead-centers to be overcome.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine, the combination with the stationary cylinder, the base of which is formed with an inlet and exhaust chamber communicating therewith, of the rotatable shaft, the sleeve journaled thereon, the hollow pistons adapted to receive steam from the inlet-chamber and formed with inlets in the rim, the eccentric driving-shaft, the disk secured thereto, the links pivotally connected with said disk at diametrically opposite points, and the cranks secured to said shaft and sleeve and pivotally connected with the links, substantially as described.

2. In a rotary engine, the combination with the cylinder, the base formed with an inlet and exhaust chamber, and the rim formed with an exhaust-opening, and the cylinder-head formed with an inlet-opening with a contracted end, and the inlet-pipe communicating therewith and with the inlet-chamber, of the rotatable shaft, the sleeve, the alternately-operating pistons formed with steam-chambers and with openings in the rims, the eccentric driving-shaft, the disk secured thereto, the links pivotally connected with said disk at diametrically opposite points, and the cranks secured to said shaft and sleeve and pivotally connected with said links, substantially as described.

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

JOHN H. PARSONS.

Witnesses:
GEORGE T. BYNG,
BENNETT S. JONES.