

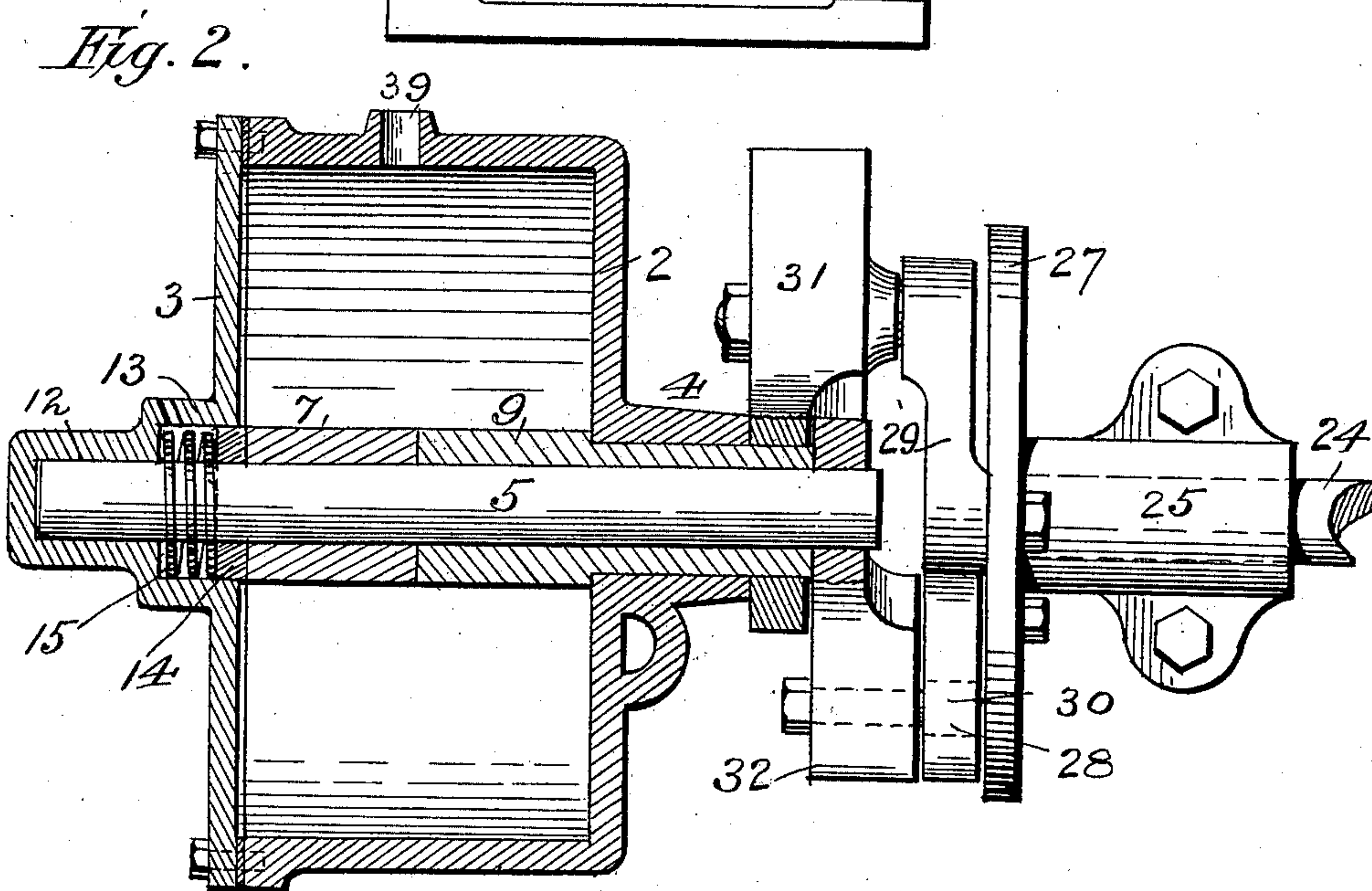
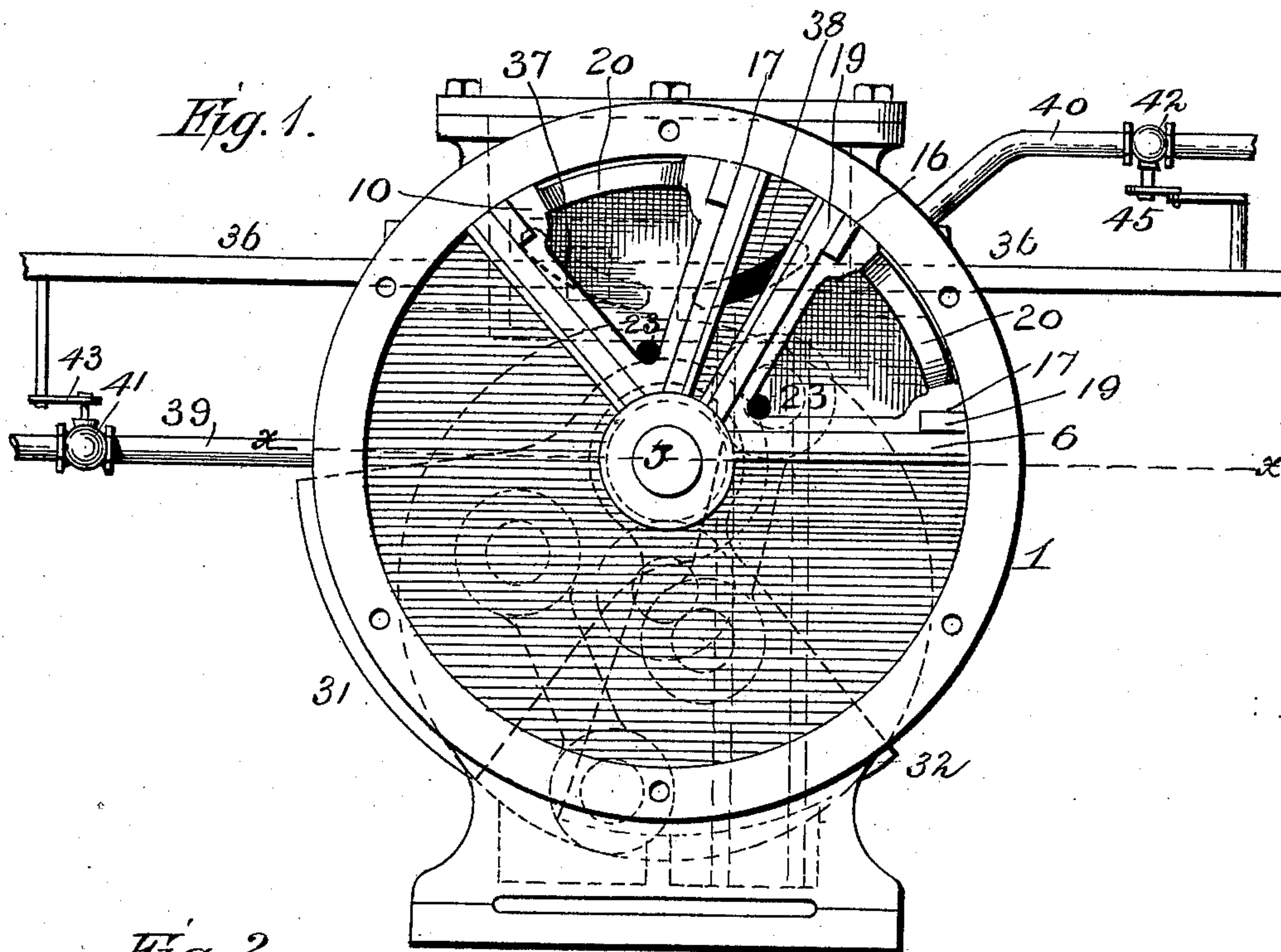
(No Model.)

2 Sheets—Sheet 1.

J. H. PARSONS.
ROTARY ENGINE.

No. 605,907.

Patented June 21, 1898.



Witnesses
F. L. Ourand
J. L. Coombs

Inventor
John H. Parsons
By Fred C. Tasker,
his Attorney

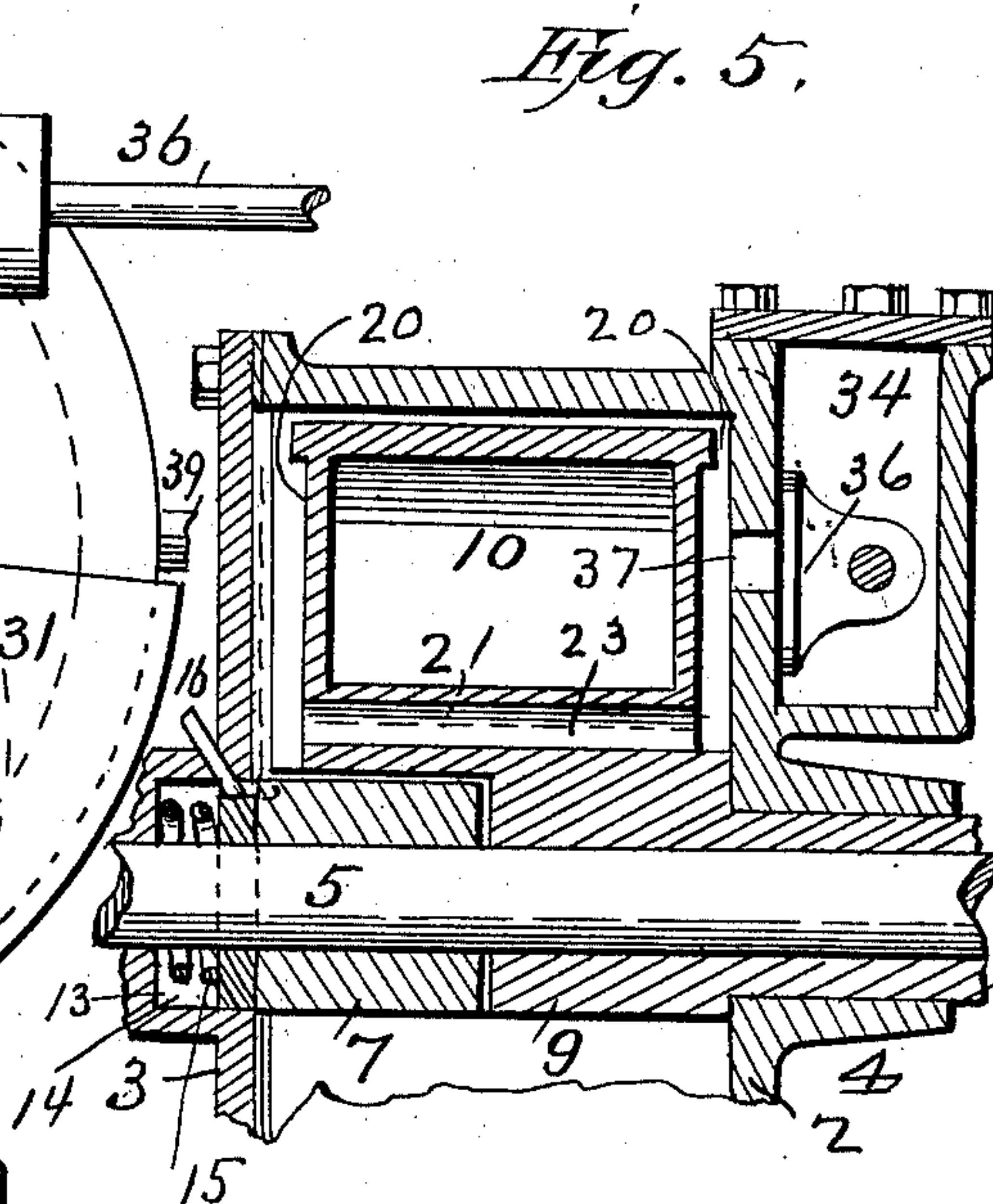
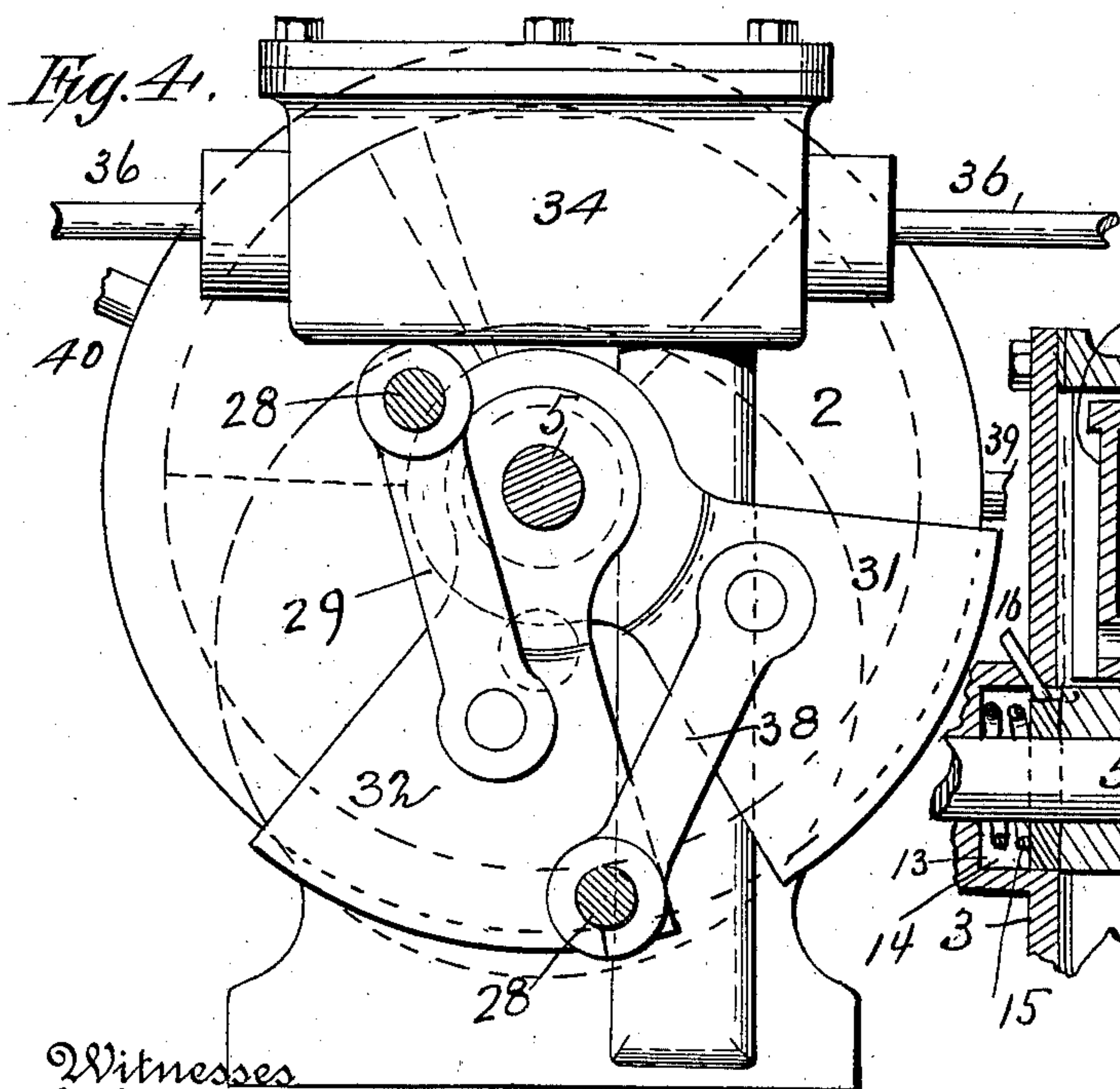
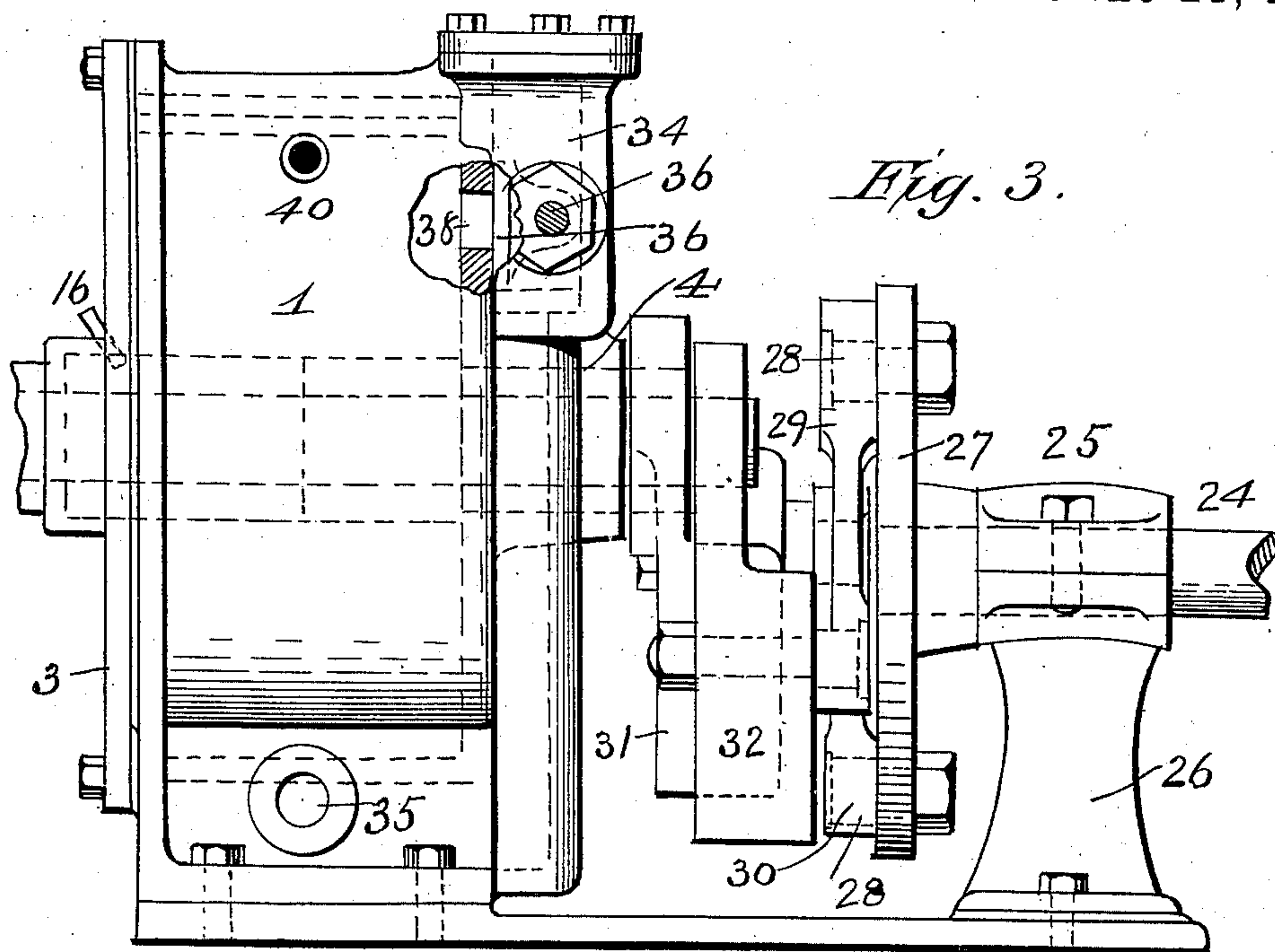
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UNITED STATES PATENT OFFICE.

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. 605,907, dated June 21, 1898.

Application filed November 20, 1897. Serial No. 659,331. (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 of that class or description for which I made application for Letters Patent August 3, 1897, Serial No. 646,856; and its object is to provide an improved construction of the same which shall possess superior advantages with respect to efficiency in operation.

The invention consists in the novel construction and combination of parts herein-after 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. Fig. 2 is a horizontal section on the line *xx*, Fig. 1. Fig. 3 is a side elevation showing the counterbalancing-cranks and the links. Fig. 4 is a transverse section. Fig. 5 is a detail longitudinal section.

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. The said head 2 is provided with a boss 4, through which passes a shaft 5, on which is journaled a sleeve 6, both of which are rotatable independently of each other. Secured to said shaft is the hub 7 of a piston 8, while secured to or formed integral with the sleeve is a similar hub 9 of a piston 10. These hubs at their adjoining ends are cut away for about one-half their length, so that the inner ends of the pistons will overlap the same.

Formed centrally in the removable head of the cylinder are two recesses 12 and 13, with which the shaft 5 and the hub 7 respectively engage. A washer 14 is interposed between

said hub and the cylinder-head, which is pressed against the hub by a spring 15, so as to make a steam-tight joint, while a dowel 16 engages with slots in the cylinder-head and washer to prevent the latter from rotating.

The pistons 8 and 10 are made wedge-shaped or triangular, and for the purpose of lightness are hollow. They are formed with peripheral grooves 17 and also with similar grooves 18 in the sides to receive packing-strips 19. Said pistons at their peripheries and sides are cut away, as at 20, so as to leave a space between them and the cylinder. There is a web 21 also formed near the inner end of each piston, having an aperture 23. The purpose of said apertures and spaces is to allow steam to enter between the pistons and cylinder and balance the pistons.

The numeral 24 designates the driving-shaft, eccentric to the cylinder and journaled in bearings 25, supported by standards 26. Secured to the inner end of the shaft is a wheel or disk 27, provided at diametrically opposite points with wrist-pins 28, to which are pivoted or journaled links 29 and 30, the opposite ends of which are pivoted to triangular-shaped cranks 31 and 32, secured to the shaft 5 and sleeve 6, respectively. These cranks are located diametrically opposite the pistons on said shaft and sleeve and serve as counterbalances for the pistons.

Secured to the cylinder-head 2 is a steam-chest 34, provided with a steam-inlet 35, and located therein is a slide 36, adapted to open and close steam-inlet ports 37 and 38 in said cylinder-head. The numerals 39 and 40 designate exhaust-pipes communicating with the cylinder, provided with turning plugs or valves 41 and 42, with which are connected cranks 43 and 45, pivoted, respectively, to opposite ends of said slide, so that as the inlet-opening at the right is opened the exhaust-opening at the left is also opened, and vice versa.

The operation is as follows: In the position shown in Fig. 1 steam is admitted between the pistons through a port 38 and will force the pistons forward in the direction of the arrow, the rear piston acting as an abutment

for the steam. 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 and is nearing the exhaust the steam-supply will be cut off and said piston be rotated by expansion, and as said piston thus 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-opening at the opposite side of the cylinder, the opposite piston will have reached the inlet-opening, when it will become the fast piston and the first 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. The counterbalance-cranks of each piston will always be opposite the same, so that the engine will run smoothly without jerks or jars. By means of the cranks and links after the piston leaves the inlet-opening the leverage will be increased until the piston passes the exhaust, when the leverage will be decreased until the piston again leaves the inlet-opening. To reverse the engine, the slide 36 is moved so as to close the said inlet and exhaust openings and open the other inlet and exhaust openings.

Having thus fully described my invention, what I claim is—

1. In an alternating-piston rotary engine, the combination with the pistons and the cylinder having inlet-openings and exhaust-pipes and the turning plugs or valves in the

exhaust-pipes, of the steam-chest, the slide for opening and closing said inlet-openings and the cranks connected with said slide and turning plugs, substantially as described.

2. In an alternating-piston rotary engine, the combination with the cylinder provided with inlet and exhaust openings, the exhaust-pipes and the turning-plugs in said pipes, the rotatable shaft, the sleeve journaled thereon, and the pistons, of the eccentric driving-shaft, the disk secured thereto, the links pivotally secured thereto at diametrically opposite points, and the counterbalance-cranks secured to the shaft and sleeve, and located opposite the pistons secured to the sleeve and shaft respectively, and the steam-chest, together with a slide and the cranks connected with said slide and turning plugs, substantially as described.

3. In an alternating-piston rotary engine, the combination with the cylinder having inlet-openings and exhaust-pipes, the steam-chest, the slide, the cranks connected therewith and the turning-plugs located in the exhaust-pipes and connected with said cranks, of the rotatable shaft, the sleeve, the piston secured thereto, cut away at the peripheries and sides, the apertured web, the packing-strips, the counterbalance-cranks secured to said shaft and sleeve, the links and the eccentric driving-wheel, substantially as described.

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

JOHN H. PARSONS.

Witnesses:

BENNETT S. JONES,
E. P. BURKET.