

No. 806,451.

PATENTED DEC. 5, 1905.

F. C. BARR & G. VON BERGEN.  
ROTARY ENGINE.

APPLICATION FILED APR. 24, 1905.

2 SHEETS—SHEET 1.

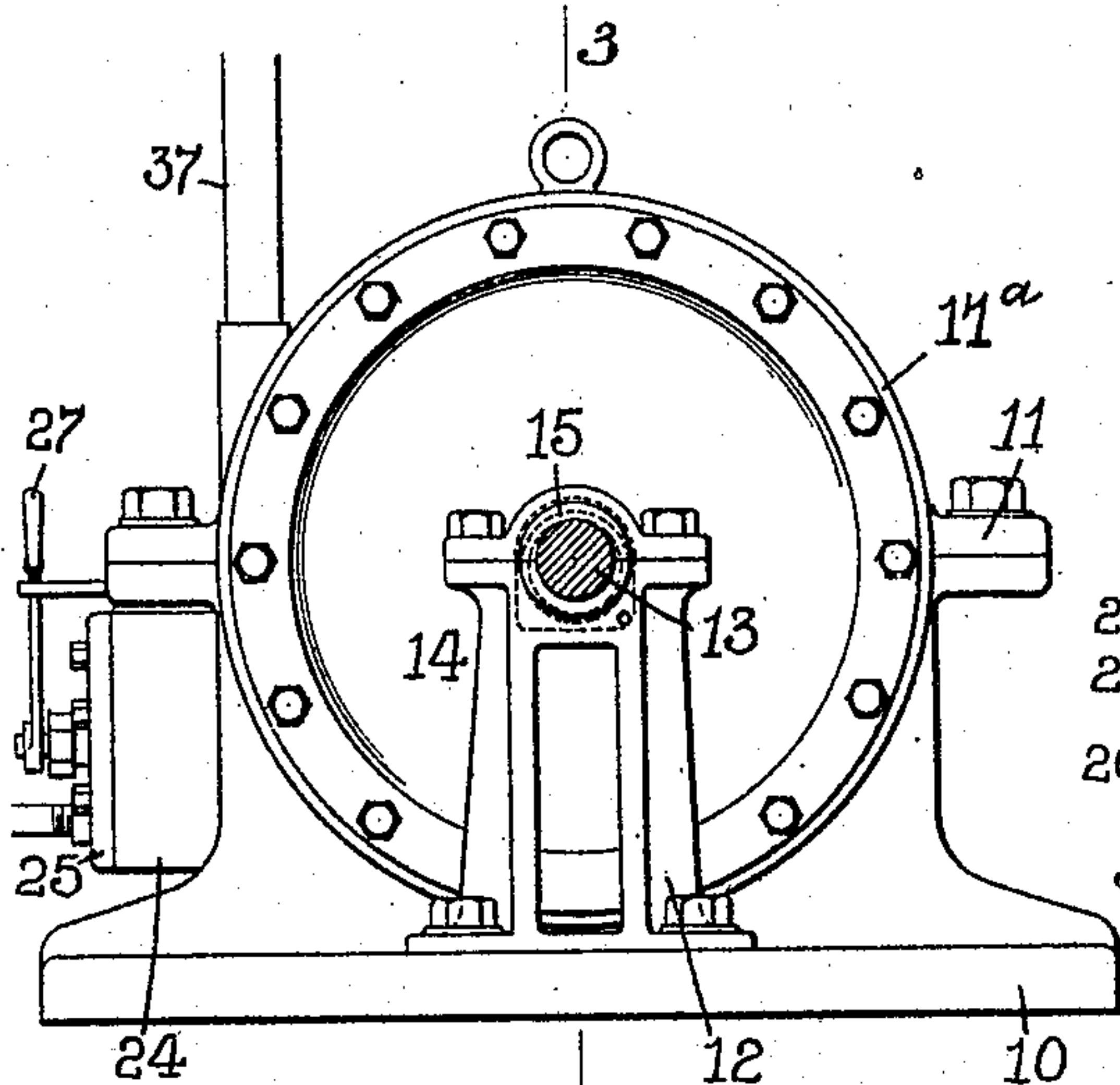


Fig. 1

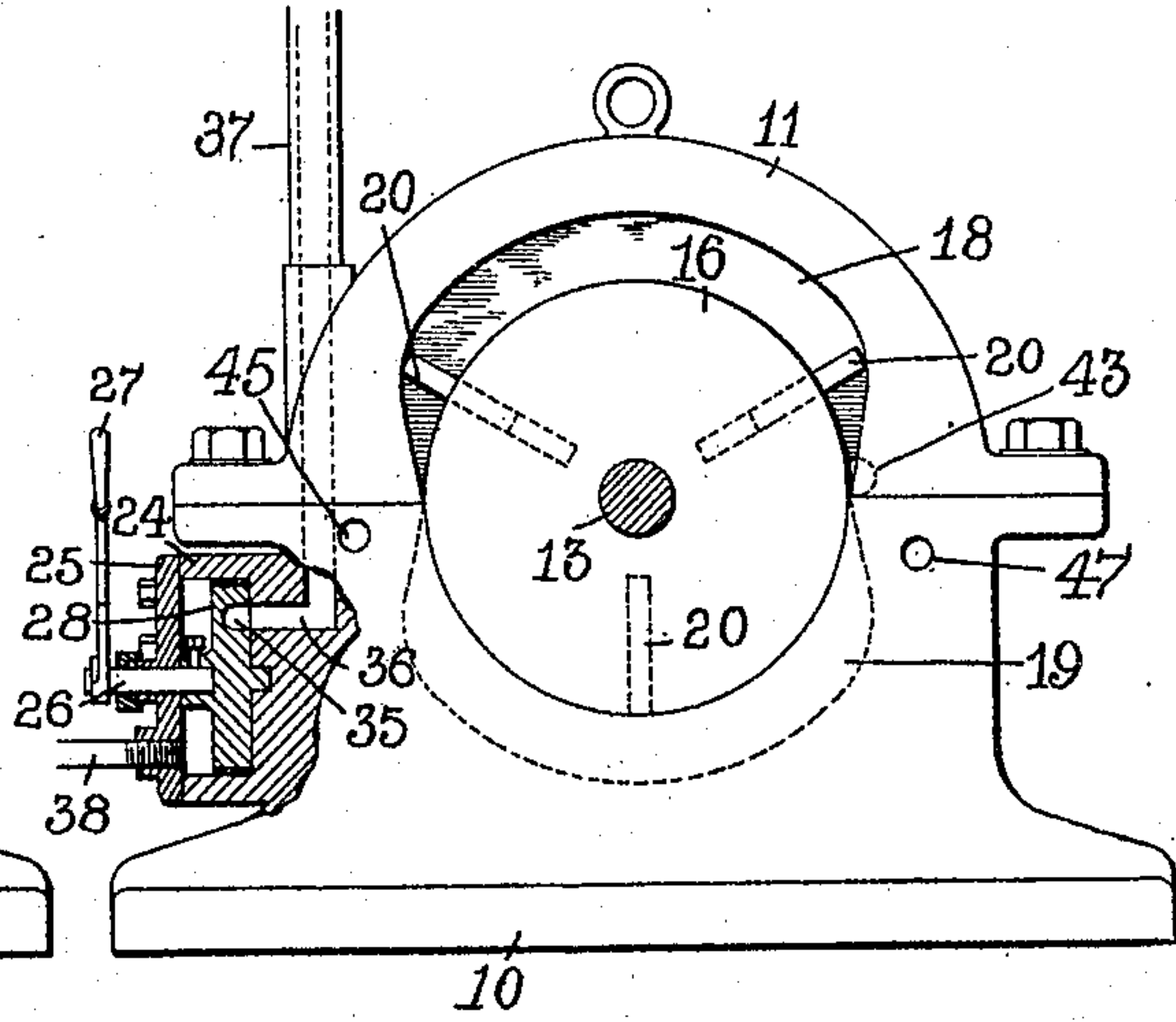


Fig. 2

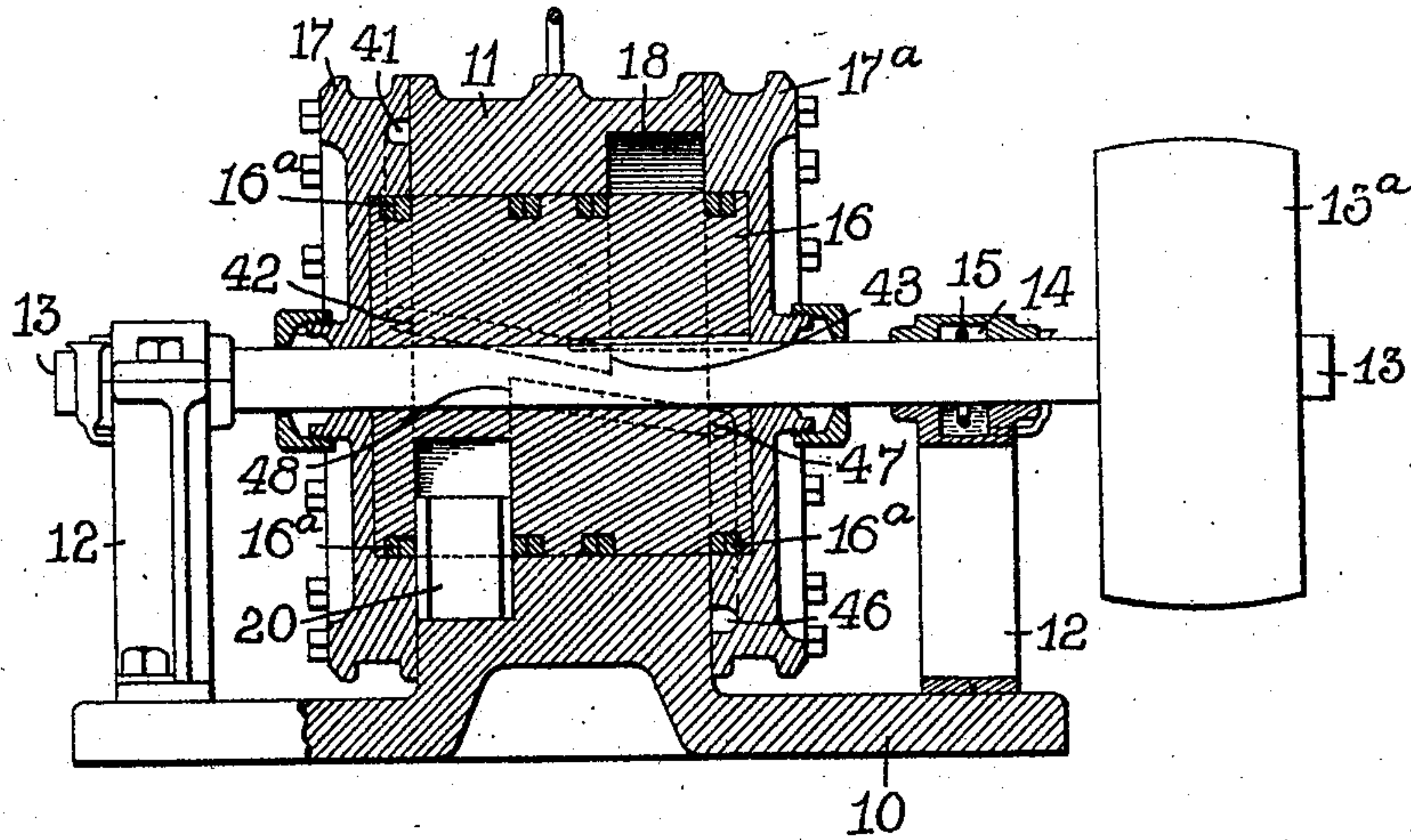


Fig. 3

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Fig. 4

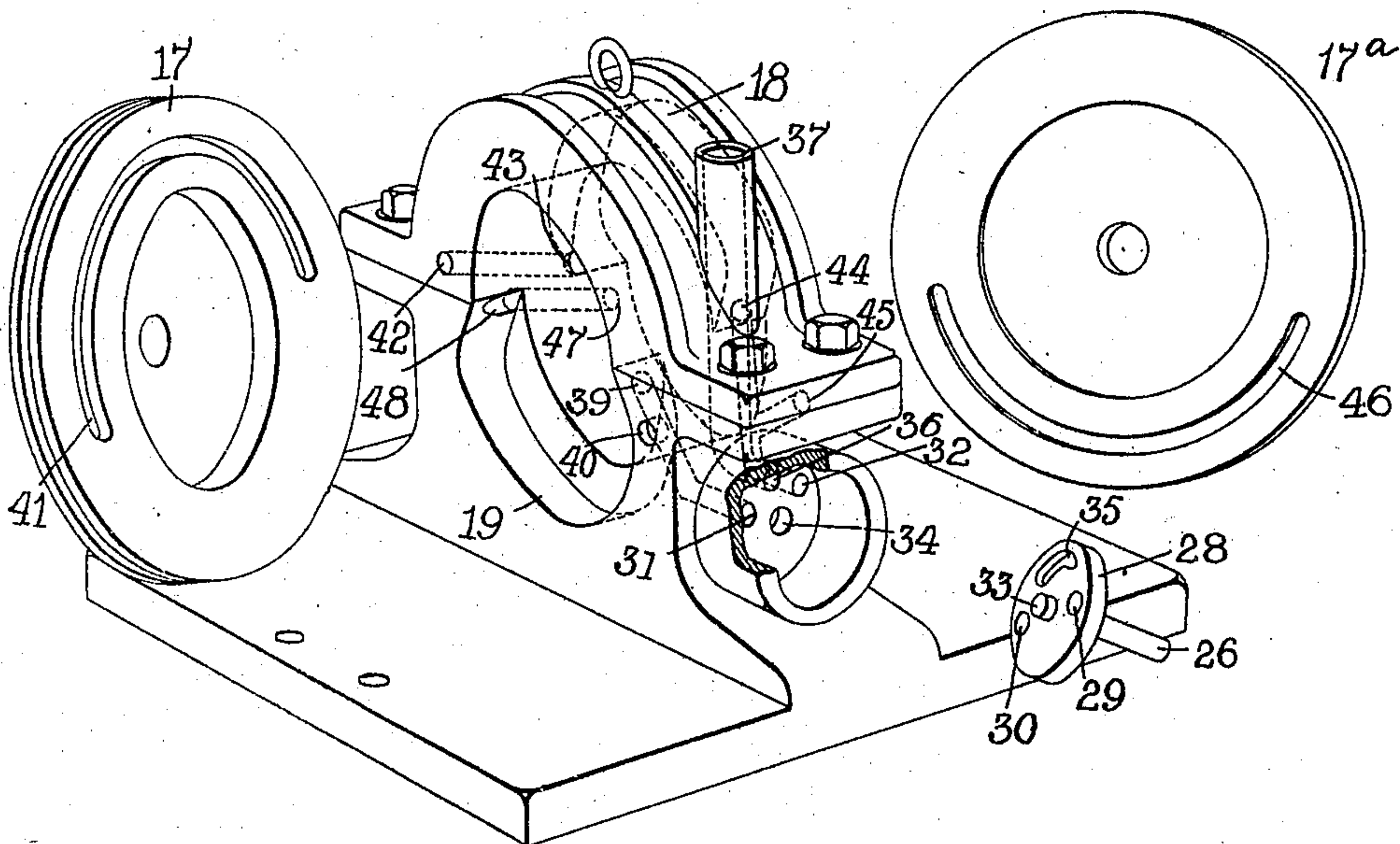


Fig. 5

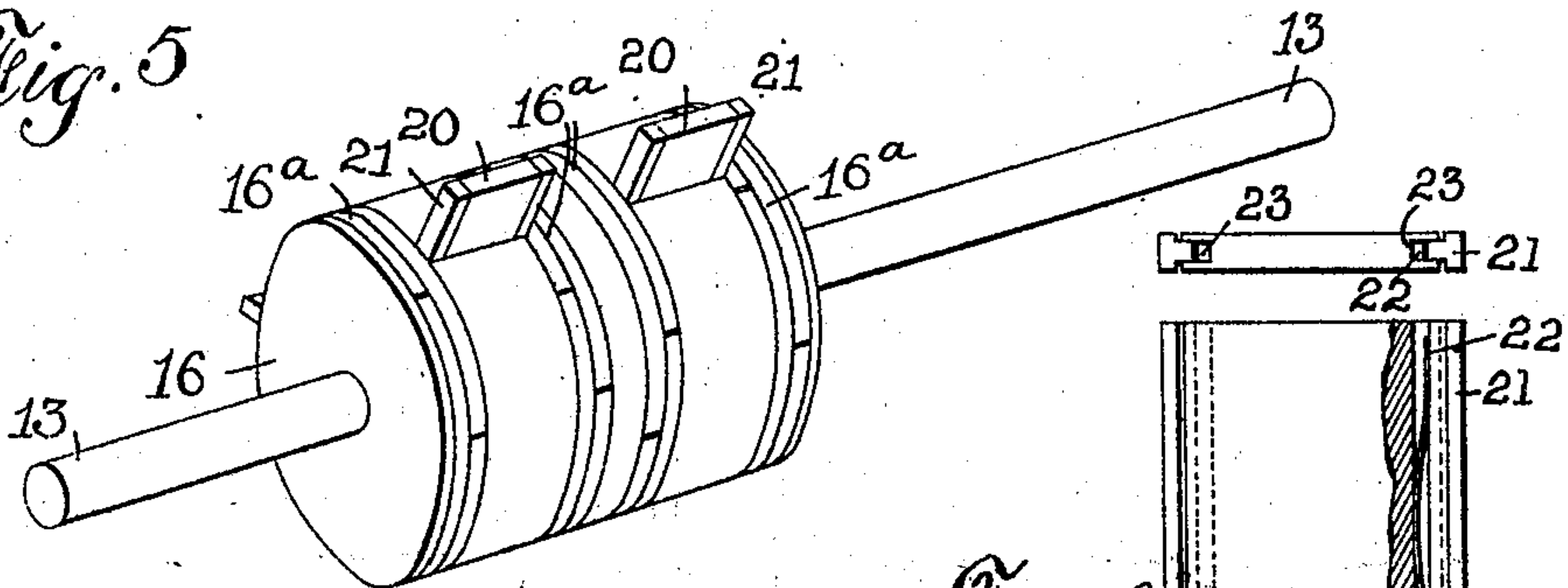


Fig. 6

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# UNITED STATES PATENT OFFICE.

FRANCIS CHARLES BARR AND GODFREY VON BERGEN, OF OAKDALE,  
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## ROTARY ENGINE.

No. 806,451.

Specification of Letters Patent.

Patented Dec. 5, 1905.

Application filed April 24, 1905. Serial No. 257,229.

*To all whom it may concern:*

Be it known that we, FRANCIS CHARLES BARR and GODFREY VON BERGEN, of Oakdale, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

This invention relates to a rotary engine with a stationary casing and a rotating piston and one in which the parts are easily separated to repair or inspect the mechanism.

Our invention also is designed to provide a compact, easily-operated, and simply-arranged throttle mechanism which can also be used to reverse the engine and which does not include a multiplicity of ports.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the machine. Fig. 2 is a similar view with one of the end plates removed and with the throttle mechanism in section. Fig. 3 is a section on line 3 3 in Fig. 1. Fig. 4 is a perspective view of the parts of the casing separated to show their construction. Fig. 5 is a perspective of the piston, and Fig. 6 is a detail of one of the gates in the piston.

The casing is composed of a lower portion 10 and an upper part 11, which are joined in their center and are secured by suitable bolts. On the end of the bed-plate are the bearings 12, which support the shaft 13, which is supplied with a pulley 13<sup>a</sup> to receive a belt to transmit the motion of the engine. The standards 12 are provided with oil-chambers 14, and a loose ring 15 runs over the shaft, the lower part of the ring running in the oil, in this way keeping the bearing well lubricated even should the oil run low. Suitably secured to the shaft 13 is a piston 16, which is provided with expansion-rings 16<sup>a</sup> to make steam-tight joints between the piston and the inside of the casings 10 and 11 and also with the inside of the end plates 17 and 17<sup>a</sup>, which are partially cut out to embrace the ends of the piston 16.

The interior of the casings 10 and 11 are enlarged at 18 and 19 on opposite sides of the casings and also are arranged so as to be opposed diametrically. In the piston 16 are arranged gates 20. These gates are placed radially and are adapted to be thrown out by the centrifugal action induced by the rotation of the piston to fit into these steam-chambers

18 and 19 and slide into the piston at the smaller part of the inside of the casings. As shown in Fig. 6 these gates 20 have end pieces 21 riding in slots 23, and springs or other suitable means 22 tend to press the sides of the gate 21 always in engagement with the sides of the chambers 18 and 19.

On one side of the casing 10 is arranged a cylindrical casing 24, having an end plate 25, this end plate acting as a bearing for the shaft 26, which is in turn operated by a lever 27. On the inside end of the shaft 26 is a disk 28, the construction of which can be seen more particularly in Fig. 4, it having two ports extending entirely through, as 29 and 30, which are arranged to be placed in register with the openings 31 and 32 in the casing, but so arranged that they cannot register at the same time. The disk 28 also has a port 35 extending radially on its surface, but not running all the way through, this port serving to throw either one of the openings 31 or 32 into communication with the port 36, and thus to the exhaust-pipe 37.

The steam enters the engine through the pipe 38 (shown in Fig. 2) into the chamber formed by the casing 24, and if the throttle has been thrown to the right the steam would enter through the port 29 into the duct 31 and part of the steam would go through the port 39 into the chamber 19 and act on the gates which happen to be in that chamber to rotate the piston, and the rest of the steam would pass out through the chamber 40 and into the groove 41 in the end plate 17. This groove acting as a pipe would then enter the opening 42 and pass through the duct and out at 43 on the opposed side of the opposite chamber 18 and acting on the gates in that chamber also tending to throw the piston around. Under these conditions the exhaust from the chamber 19 would pass out through the port 48 and out at 47. It would then enter the groove 46 in the end plate 17<sup>a</sup>, enter the casing again at 45, to be joined there by the exhaust from the chamber 18, passing out at 44, and they both would be forced out at the port 32 into the port 35 and from there pass into the exhaust 36. It will also be seen that if the throttle is thrown over to the left the path that has just been described for the entrance of the steam would act as the exhaust, the port 35 connecting with 36, and the steam would enter through the port 30 into 32 and the path previously



described for the exhaust would be utilized as inlet-ports.

It will thus be seen that the machine is equipped and constructed so as to allow an examination and cleaning of the ports and is at the same time a cheap construction, the machine being taken apart very readily.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A rotary engine, comprising a casing, a cylinder adapted to rotate in the casing, chambers in the casing on opposite sides of the casing and arranged diametrically opposite, end plates on the casing to embrace the ends of the piston, a steam-inlet at one end of the casing, steam-ducts in the casing connecting the steam-chamber with opposed ends of each of the chambers, ducts in the end plates connecting the opposed ends of opposite chambers, and a throttle arranged to admit live steam alternately to one or the other of the sets of steam-ports.

2. A rotary engine, comprising a casing, a piston arranged to rotate in said casing, chambers arranged on opposite sides of the casing and diametrically opposite, radial gates sliding in the piston, end plates on the casing ar-

ranged to embrace the ends of the piston, a steam-chamber arranged on one end of the casing, ducts connecting opposed ends of opposite chambers to opposite sides of the casing, ducts in the end plates to connect the ducts leading from the opposed end of the chambers, and a throttle in the steam-chamber arranged to alternately throw one or the other of the sets of steam-ports in communication with the steam-chamber.

3. A rotary engine, comprising a casing having diametrically-opposed chambers, one on each side, a piston arranged to rotate in the casing, gates radially arranged to slide in the piston, a steam-chamber on one end of the casing, a pair of ducts connecting opposed ends of opposite chambers, a rotatable disk arranged in the steam-chamber, means for operating the disk, ports in the disk adapted to be thrown in register with one of the steam-ports of the casing, and a port in the disk arranged to connect the other set of ports with the exhaust of the engine.

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