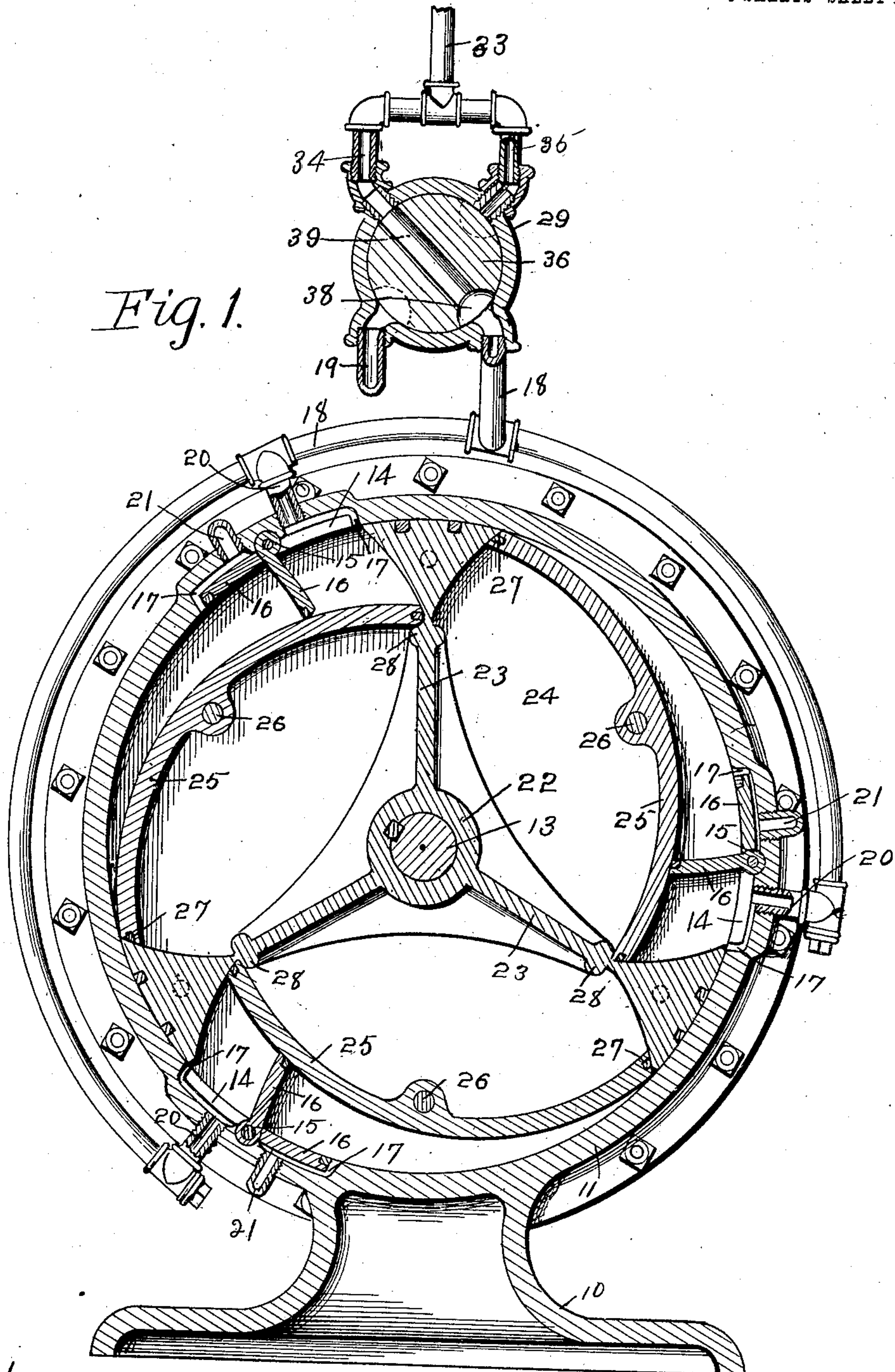


No. 830,673.

PATENTED SEPT. 11, 1906.

J. RODBERG.
ROTARY ENGINE.
APPLICATION FILED JAN. 29, 1906.

3 SHEETS—SHEET 1.



Witnesses
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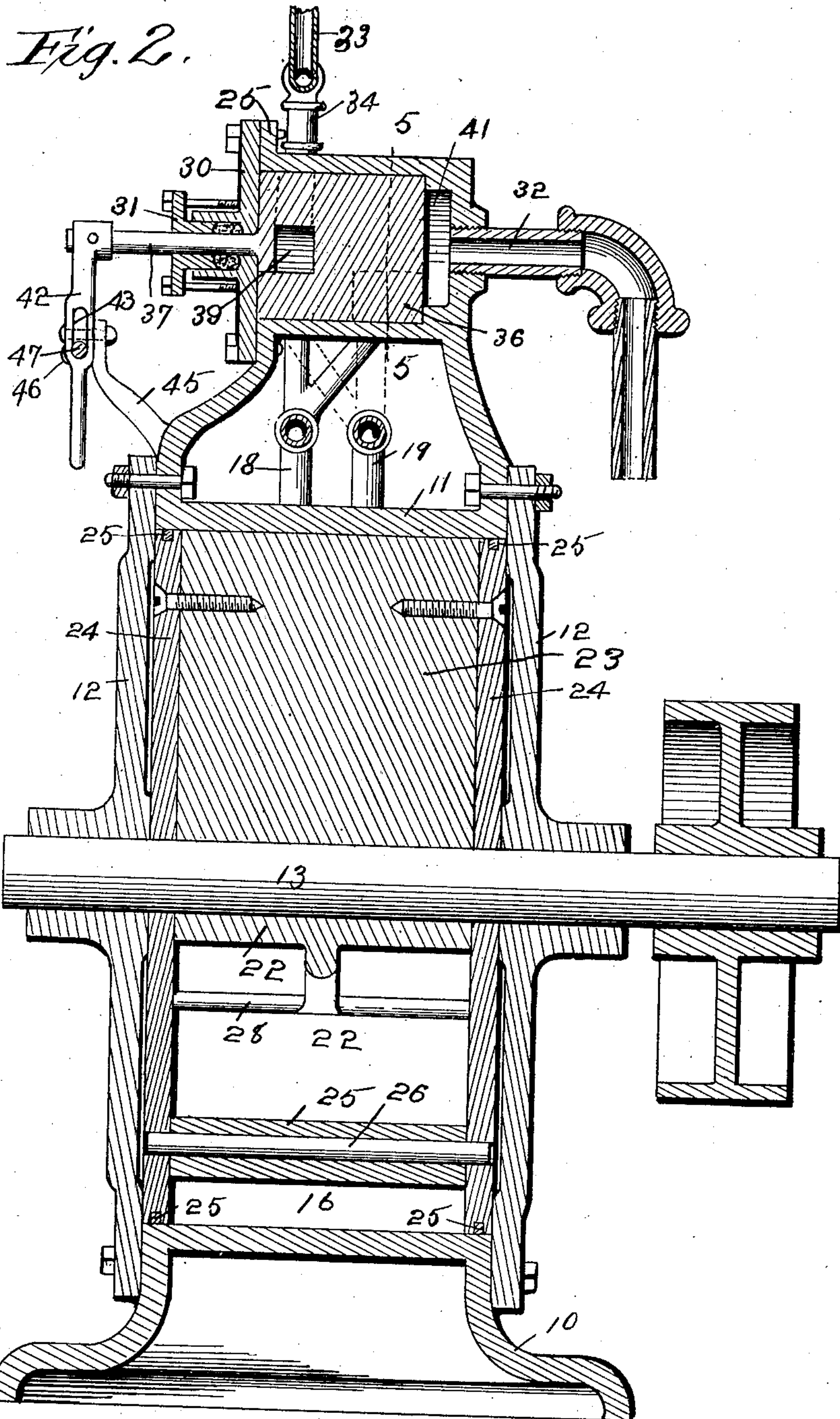
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3 SHEETS—SHEET 3.

Fig. 4.

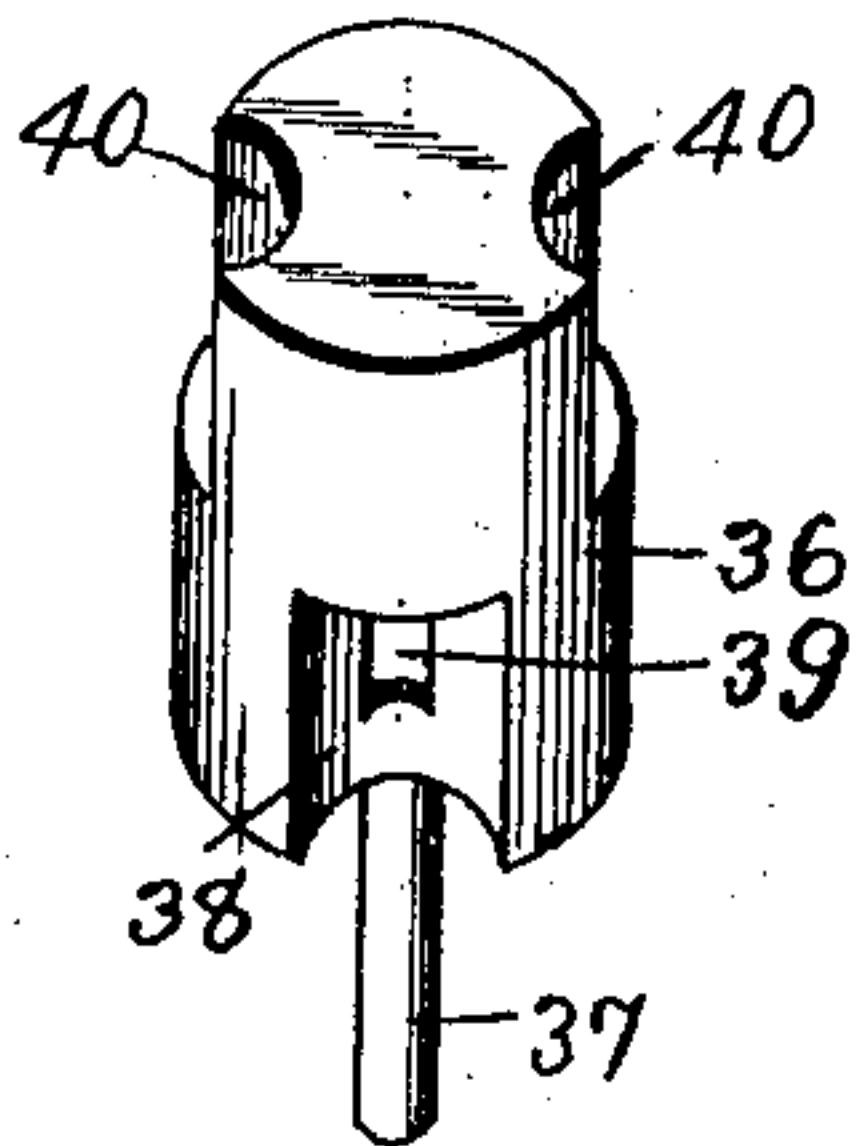


Fig. 5.

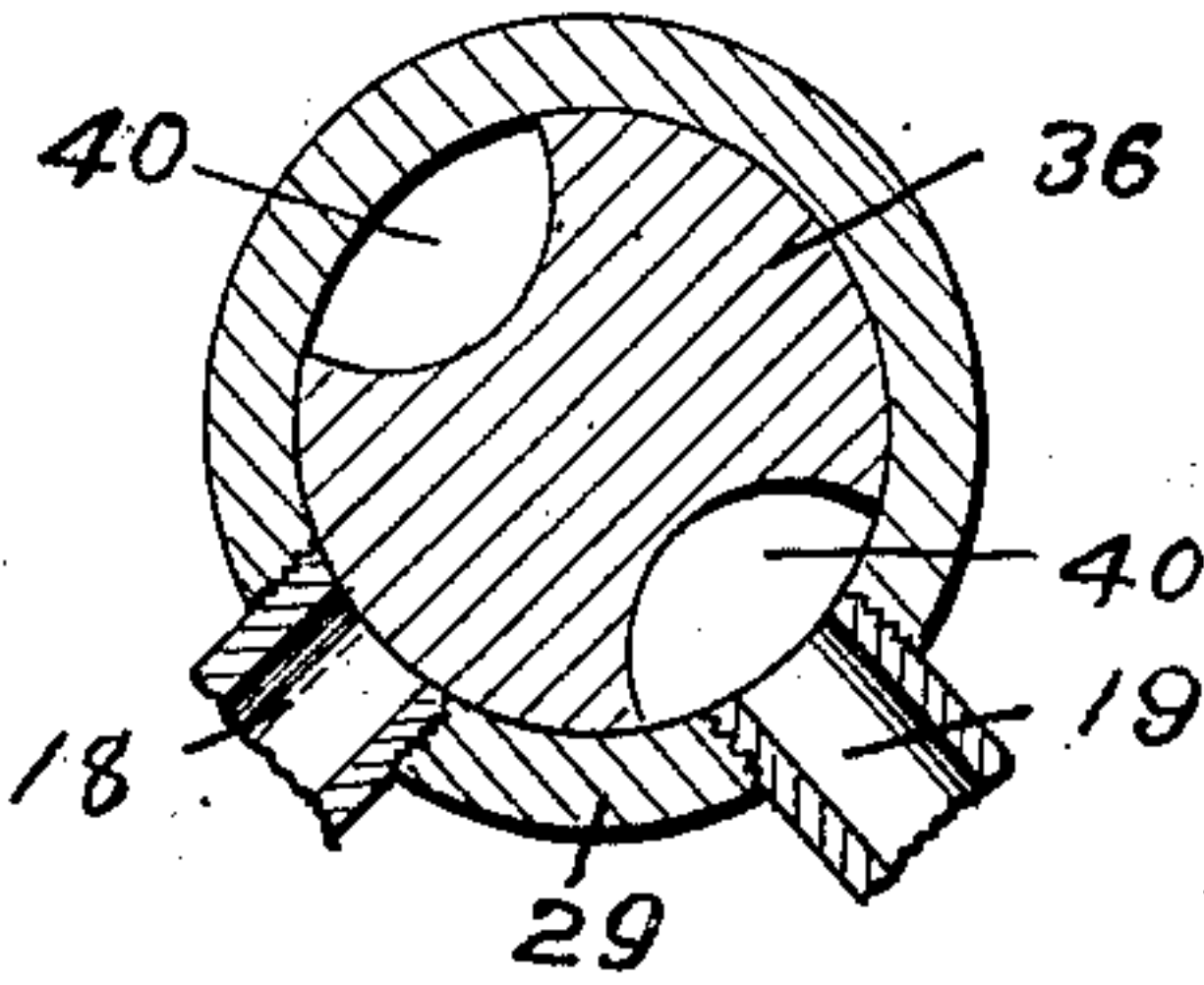


Fig. 3.

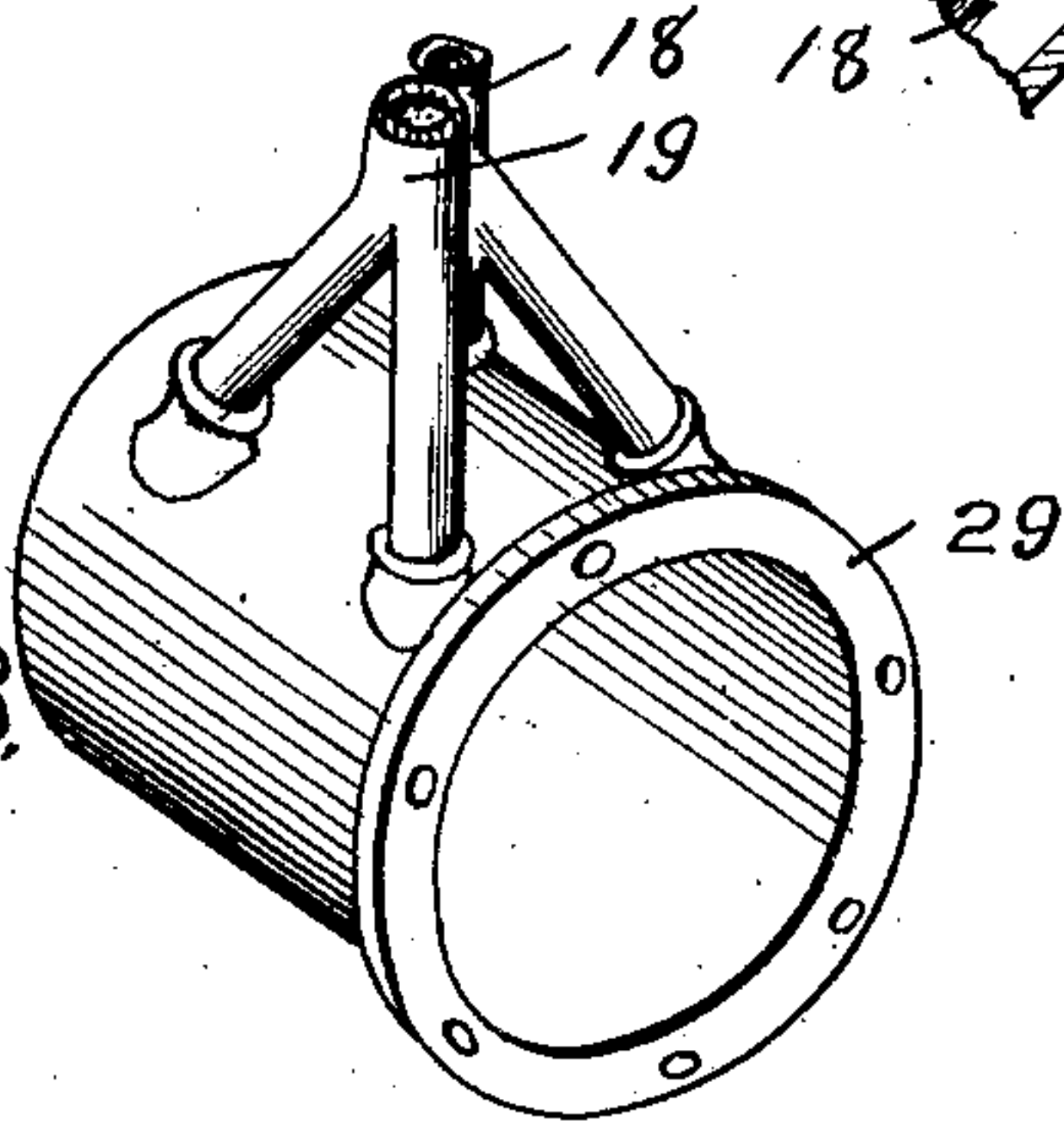


Fig. 7.

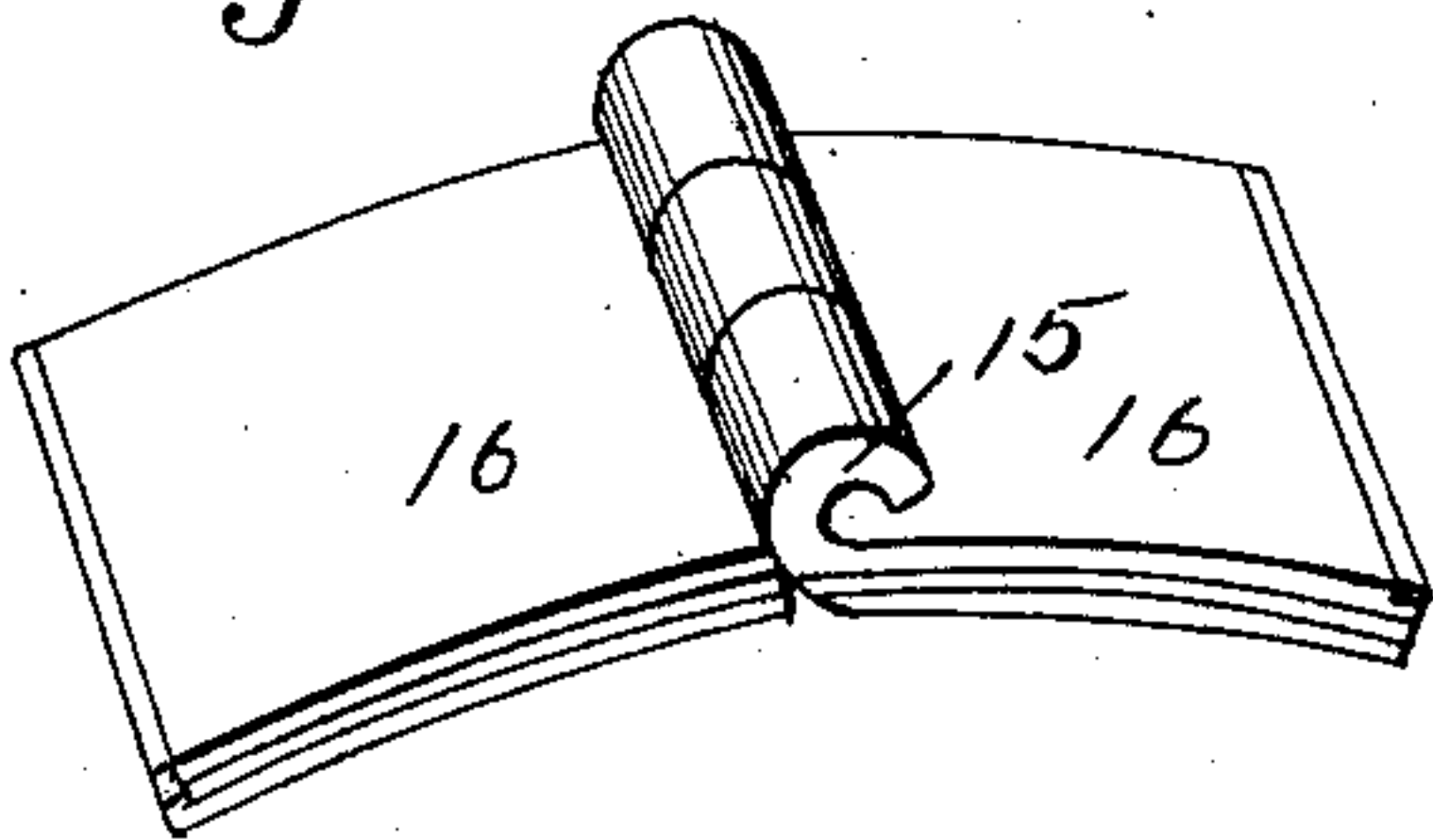


Fig. 6.

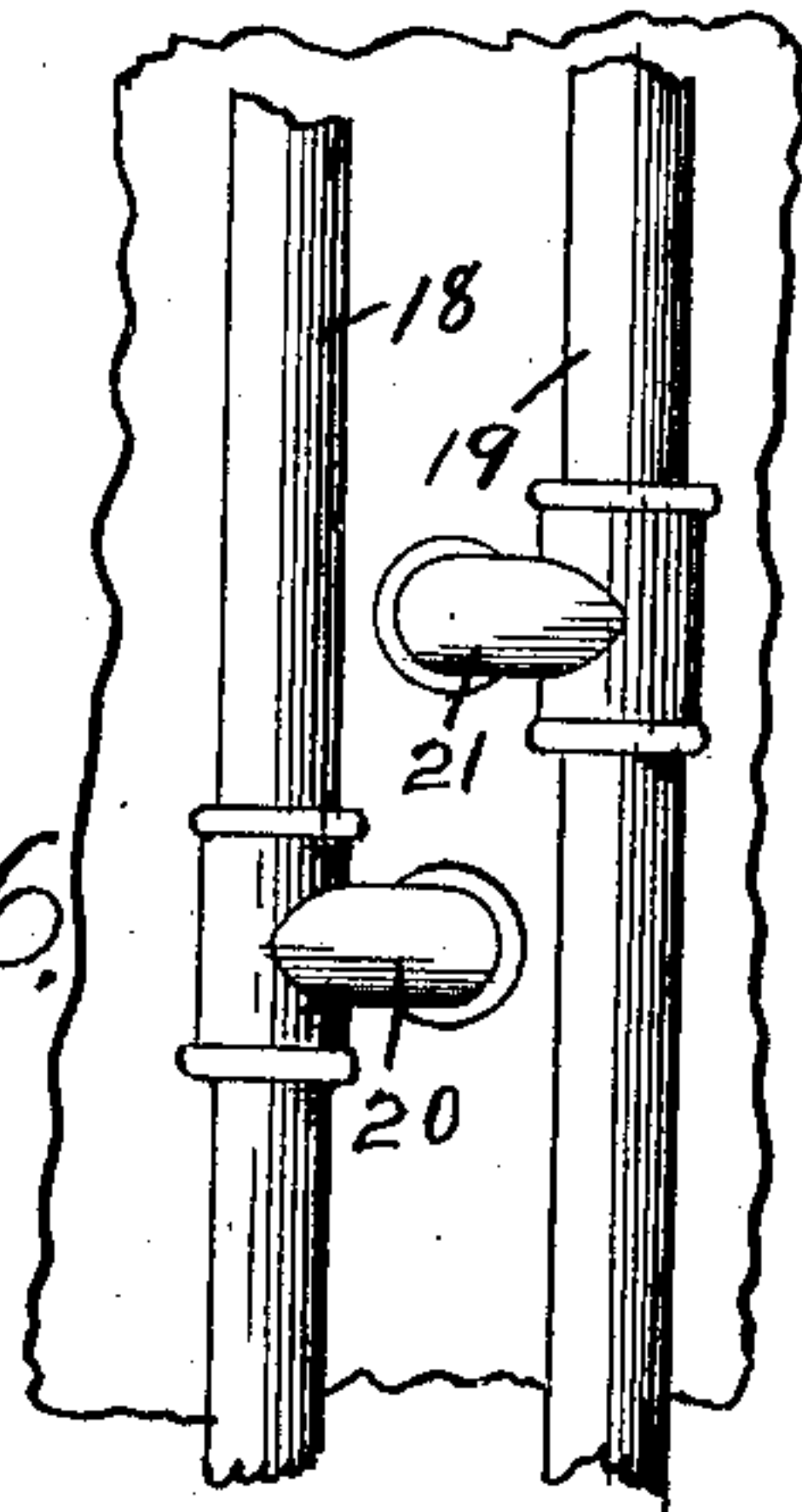


Fig. 9.

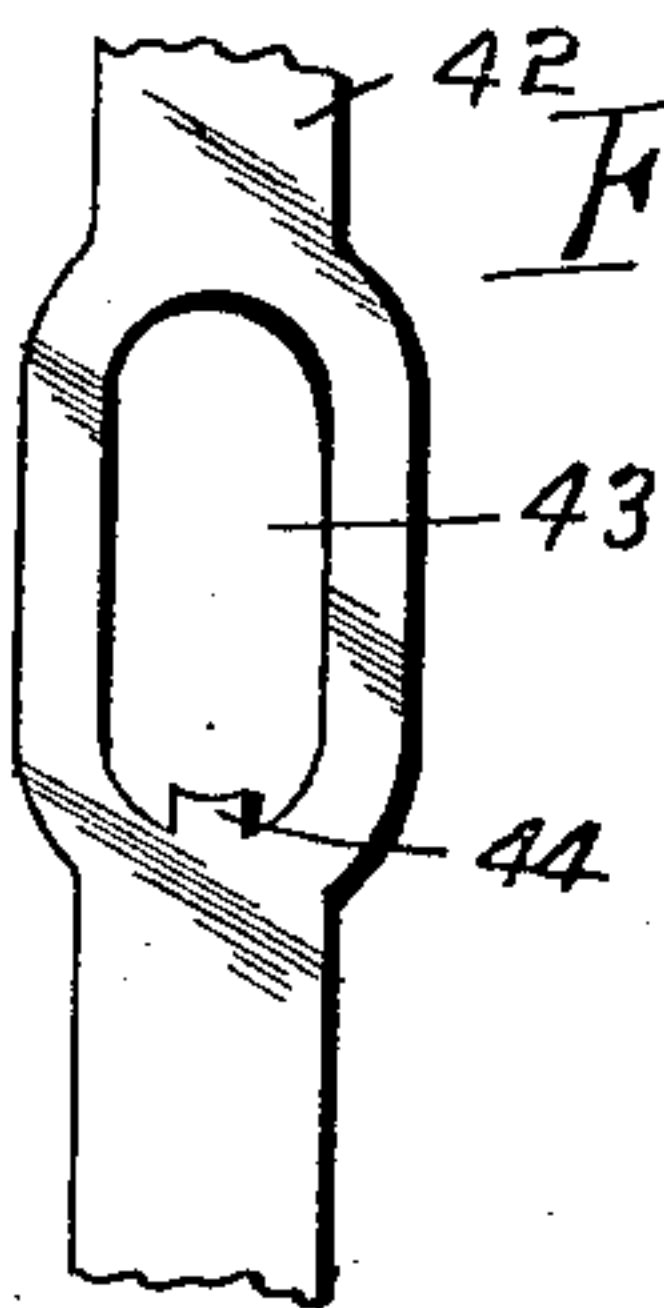
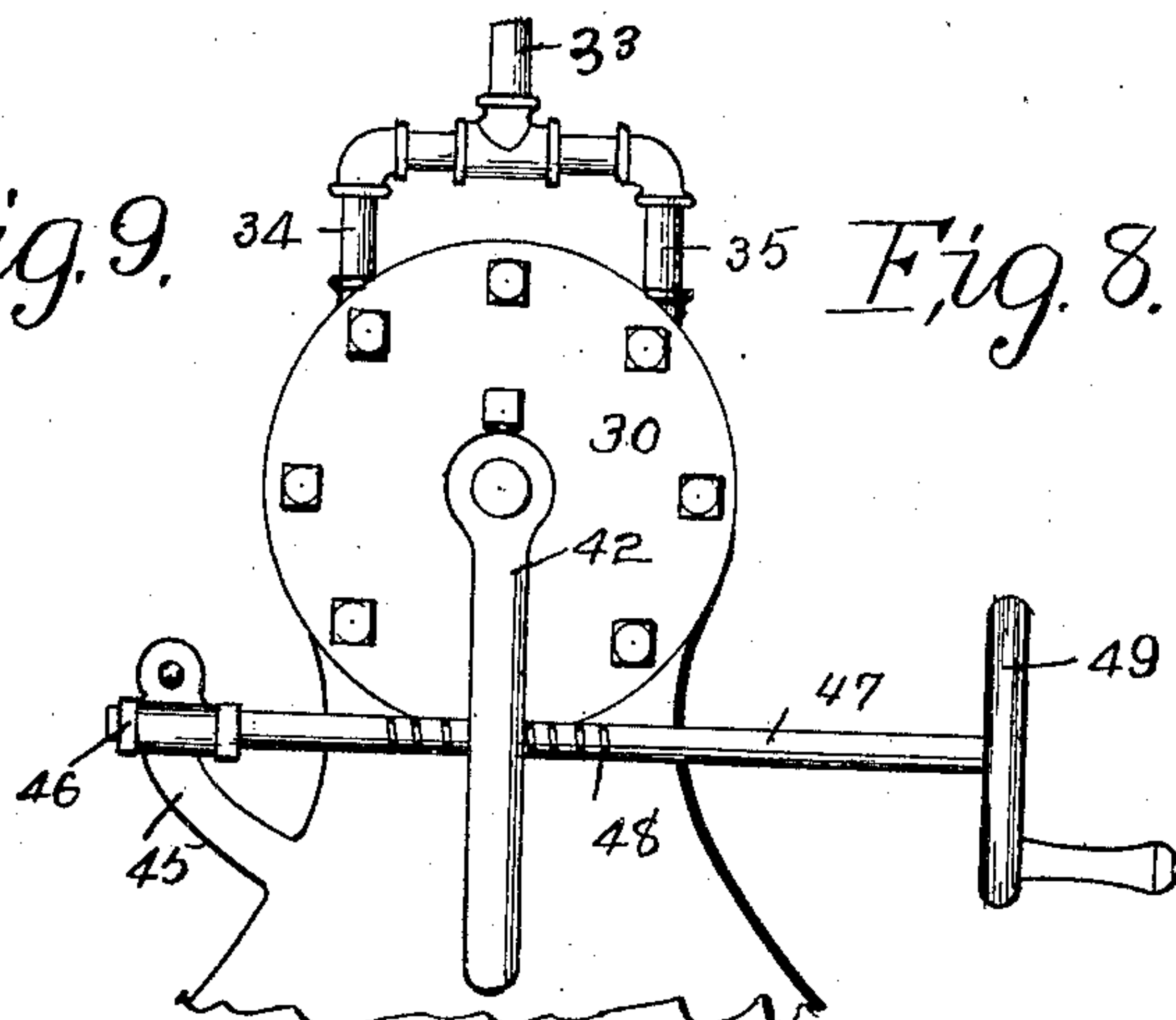


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN RODBERG, OF MARQUISVILLE, IOWA.

ROTARY ENGINE.

No. 830,673.

Specification of Letters Patent.

Patented Sept. 11, 1906.

Application filed January 29, 1906. Serial No. 298,330.

To all whom it may concern:

Be it known that I, JOHN RODBERG, a citizen of the United States, residing at Marquisville, in the county of Polk and State of Iowa, have invented a certain new and useful Rotary Engine, of which the following is a specification.

The objects of my invention are to provide a rotary steam-engine of simple, durable, and inexpensive construction.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical transverse sectional view of the complete engine embodying my invention. Fig. 2 shows a vertical longitudinal sectional view of same. Fig. 3 shows a perspective view of the valve-chamber. Fig. 4 shows a perspective view of the valve. Fig. 5 shows a sectional view of the valve-chamber and valve on the line 5 5 of Fig. 2. Fig. 6 shows a detail view illustrating the arrangement of the pipes for conducting steam to and from the cylinder, showing part of the cylinder with the pipes entering it. Fig. 7 shows a detail perspective view of the hinge-blades of the engine. Fig. 8 shows an end view of the valve-chamber to illustrate the means for adjusting the valve, and Fig. 9 shows an enlarged detail view of part of the valve-lever.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the engine-base, to which the cylinder-body 11 is fixed. Two cylinder-heads 12 are bolted to the side of the body, and the engine shaft 13 extends through them.

Contained within the cylinder is a number of hinge-blades with their pipes for conducting steam to and from the cylinder. These are all alike, and hence but one need be particularly described. A recess is formed on the interior of the cylinder at 14, and arranged centrally within this recess is a hinge-pin 15, to which two blades 16 are pivoted. These blades are designed to move independently of each other on the hinge-pin and are capable of lying wholly within the recess 14 and also of swinging inwardly toward the center of the cylinder. The recess 14 is provided with passage-ways 17 to admit steam behind the blades when they lie flat in the re-

cess. Two independent pipes 18 and 19 pass around the engine-cylinder and each communicates by the branches 20 and 21, respectively, with the recess 14 on opposite sides of the hinge-pin 15. When the engine is running in one direction, steam is admitted to it through the pipe 18 and branch 20 and is discharged from it through the branch 21 and the pipe 19, and when the engine is running in an opposite direction the steam passes through these pipes in the reverse direction.

Mounted upon the shaft 13 is the rotary hub 22, containing three radial partitions 23. Secured to the ends of the hub 22 are the circular plates 24, having packing-rings 25 on their peripheries to engage the interior of the cylinder. Contained within each compartment of the hub is a segmental rocking plate 25. Mounted on the pin 26, which has its ends secured to the plates 24 in the ends of the plates 25, are the packing-strips 27, and the said plate 25 is so shaped and arranged that it may swing on its pivot-pin with one end adjacent to the cylinder and also to the partition 23 and its other end spaced apart a considerable distance from the cylinder, but also in engagement with the adjacent partition 23, the movement of the plate 25 in both directions being limited by lugs 28, formed on the partitions 23.

Arranged above the cylinder is a valve-casing 29, provided with a head 30, having a packing-box 31. On the other end of the casing is an exhaust-pipe 32. Communicating with the top of the casing is a steam-supply pipe 33, formed with two branches 34 and 35, both entering the valve-chamber. The pipes 18 and 19, before described, each communicate with the valve-chamber by means of two branches, one running to the forward end portion of the valve-chamber, the other to the rear end portion near one side of the valve-chamber, and the other similarly arranged near the other side of the valve-chamber. The valve within the chamber comprises a cylinder-shaped block 36, provided with a valve-stem 37 at its front end. Near its front end are two recesses 38, communicating with each other through the passage-way 39, and at its other end are two recesses 40, out of communication with each other, but leading to the end of the valve, so that steam entering either of these recesses from the exhaust-pipes may pass to the chamber 41 at the rear of the valve-chamber, and thus discharge through the exhaust-pipe 32.

When the valve 36 is set to the position shown in Fig. 1, steam will enter through the branch 35 and the passage-way 39 into the recess 38 and from thence to the pipe 19, and
 5 the exhaust from the pipe 18 will enter the valve-chamber through one of the branches of said pipe and pass into one of the recesses 40, as shown by dotted lines in Fig. 1, and from this recess will pass into the chamber 41
 10 and the exhaust-pipe, thus making a complete circuit, or if the engine is to operate in a reverse way the valve 36 is shifted so that the branch 34 communicates with the passage-way 39, and when this is done steam
 15 will pass through one pipe 18 and from thence to the engine and will return through the pipe 19 to the opposite one of the recesses 40 and from thence to the exhaust-pipe, or if the valve 36 is so set that the passage-way 39
 20 will not register accurately with either of the supply-pipes 34 or 35 then the volume of steam admitted to the engine will be reduced.

I have provided for controlling the valve 36 as follows: On the stem 37 is a lever 42,
 25 formed with a slot 43, having a tooth 44 at its lower end. On the engine-frame is an arm 45 to support a pivoted hanger 46. Rotatably mounted in this hanger 46 is a shaft 47, passed through the opening 43 and
 30 formed with a spiral groove 48 to receive the tooth 44. On the free end of the shaft 48 is a crank-wheel 49. This shaft 47 normally rests in the bottom of the opening 43, and the tooth 44 rests in the groove 48. By turning
 35 the crank-wheel the arm 42 may be rotated in either direction and adjusted very accurately to control the quantity of steam admitted to the engine. If it is desired to reverse the engine, the shaft 47 may be raised
 40 to release from the tooth 44. Then the lever 42 may be moved by hand.

In practical use and assuming the parts of the engine to be in the position shown in Fig. 1 steam is admitted to the branch 34 through
 45 the passage-way 39 into the recess 38 through the pipe 19 and a branch 20. If the rotary part of the engine is in the position shown in Fig. 1, steam is admitted into the chamber bounded by the blade 16, the plate 25, and
 50 the partition 23. The packing on the end of the blade 16 forms a steam-tight joint against the plate 25 and is yieldingly held against it by the pressure of the steam, so that no springs are necessary. When the steam ex-
 55 pands, the top of the rotary hub moves toward the right and the blade 16 moves toward the recess 14 as the pivotal point of the plate 25 approaches the blade 16. During this time the air on the other side of the blade
 60 16 will exhaust through the passage-way 17 behind the other blade 16 and will discharge through the branch 21. In this way the pressure of the steam holds both the blade 16 and the plate 25 to proper position, and even
 65 if the plate 25 should tilt it will assume proper

position again as soon as steam is admitted behind one end of it. When the engine is reversed, the plate 25 tilts automatically by the pressure of steam, and the operation is the same as before except that the induction-
 70 port before described becomes the exhaust-port, and vice versa.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is— 75

1. A rotary engine comprising a cylinder formed with a recess on its interior, a supply and an exhaust pipe communicating with the opposite ends of said recess, two blades hinged to the cylinder and independently
 80 movable to lie in the recess or to project inwardly from it, a rotary hub mounted in the cylinder, radial partitions in the hub and a segmental blade pivoted in the recess with its ends in engagement with the radial partitions 85 and its central portion spaced apart from the interior of the cylinder, said segmental plate to be engaged by said hinged blades.

2. A rotary engine comprising a cylinder formed with a recess on its interior and with
 90 passage-ways in the recesses, a supply-pipe communicating with the passage-way in one end of the recess and an exhaust-pipe communicating with the passage-way in the other end of the recess, two hinged blades inde- 95 pendently movable mounted in the central portion of said recess and designed to be moved to position resting wholly within the recess and also capable of swinging inwardly, an engine-shaft, a rotary hub fixed to the 100 shaft and comprising two end plates, a number of radial partitions, said partitions formed with curved extensions at their outer ends and with shoulders at the inner ends of said curved extensions and a segmental plate 105 pivoted between the side plates of the hub with both ends in engagement throughout their entire limit of movement with the curved extensions on the lateral hubs, the inner movement of each end of said segmental 110 plate being limited by said shoulders on the radial partitions.

3. A rotary engine comprising an engine-cylinder formed with a recess on its interior and with a passage-way at each end of the 115 recess, a pipe communicating with each of said passage-ways, two blades hinged at the center of the recess and capable of swinging inwardly and also capable of lying wholly within the recess without closing said pas- 120 sage-way, means for admitting steam to either one of said pipes and for arranging the other pipe to serve as an exhaust, an engine-shaft, a rotary hub fixed to the shaft and comprising two end plates, a number of ra- 125 dial partitions, said partitions formed with curved extensions at their outer ends and with shoulders at the inner ends of said curved extensions and a segmental plate pivoted between the side plates of the hub with 130

both ends in engagement throughout their entire limit of movement with the curved extensions on the radial hubs, the inner movement of each end of said segmental plate being limited by said shoulders on the radial partitions.

4. The combination with a reversible rotary engine, of two pipes running around and communicating with the inlet and exhaust ports thereof a valve-chamber having an exhaust-opening at at one end, a steam-supply pipe having two branches communicating with the chamber at opposite sides of its top portion near the end thereof, opposite from the exhaust-opening, one of the pipes running around the engine provided with two branches communicating with the valve-chamber at one side of its under portion, one branch near the front, the other near the rear, the other pipe provided with branches communicating with the opposite side of the lower portion of the valve-chamber, one branch at the front and the other at the rear, a rotary valve within the chamber having a passage-way extending through it near its front designed to establish communication between one branch of the supply-pipe and one branch of either of the pipes that run around the engine, said valve formed at its rear end with two chambers at diametrically opposite sides designed to establish communication between the exhaust branch of the pipe running around the engine opposite from the one that is in communication with the steam-supply pipe and means for operating said rotary valve.

5. The combination with a reversible rotary engine, of two pipes running around the

engine and communicating with the inlet and exhaust ports thereof, a valve-chamber having an exhaust-opening at one end, a steam-supply pipe having two branches communicating with the chamber at opposite sides of its top portion near the end thereof, opposite from the exhaust-opening, one of the pipes running around the engine provided with two branches communicating with the valve-chamber at one side of its under portion, one branch near the front, the other near the rear, the other pipe provided with branches communicating with the opposite side of the lower portion of the valve-chamber, one branch at the front end, the other at the rear, a rotary valve within the chamber having a passage-way extending through it near its front designed to establish communication between one branch of the supply-pipe and one branch of either of the pipes that run around the engine, said valve formed at its rear end with two chambers at diametrically opposite sides designed to establish communication between the exhaust branch of the pipe running around the engine opposite from the one that is in communication with the steam-supply pipe, and means for operating said rotary valve, said means comprising a lever connected to the valve and formed with a slot provided with a tooth, a rotary shaft hinged at one end extended through the slot and having a spiral groove to receive said tooth.

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Witnesses:

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