

No. 734,882.

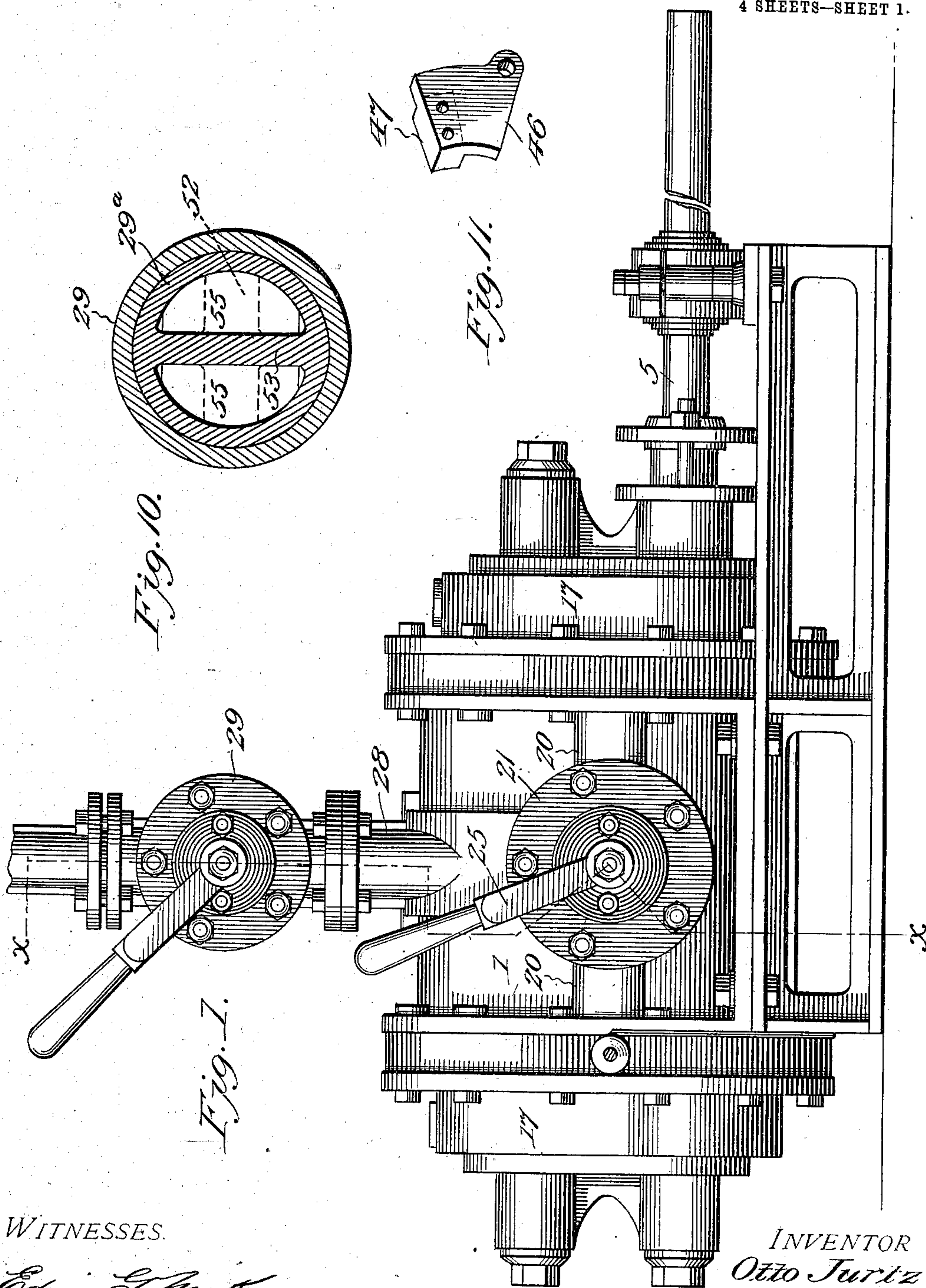
PATENTED JULY 28, 1903.

O. JURTZ.
ROTARY ENGINE.

APPLICATION FILED JAN. 28, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES.

Edwin L. McKee
Herbert D. Lawson

INVENTOR
Otto Jurtz
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Attorney

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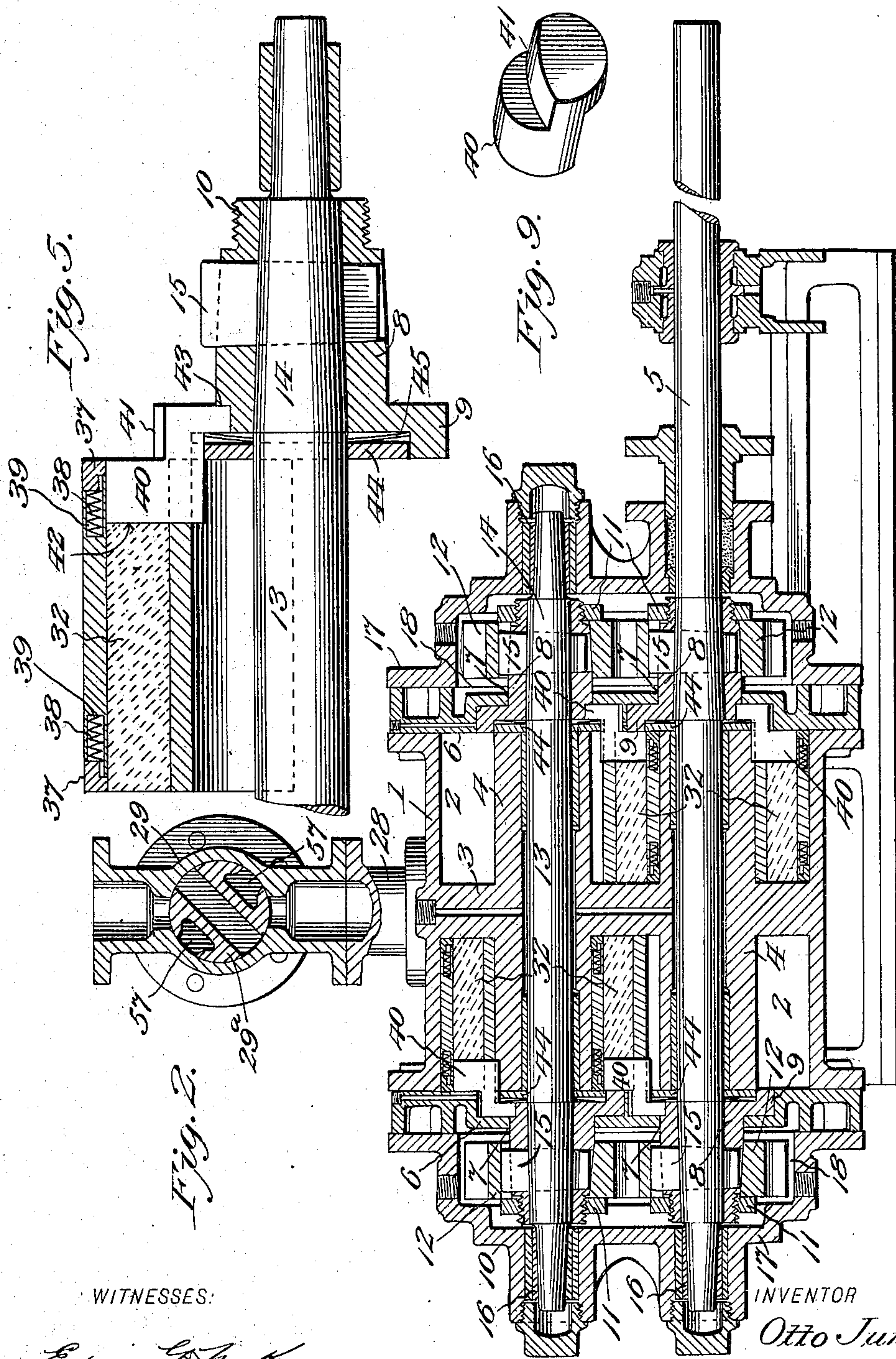
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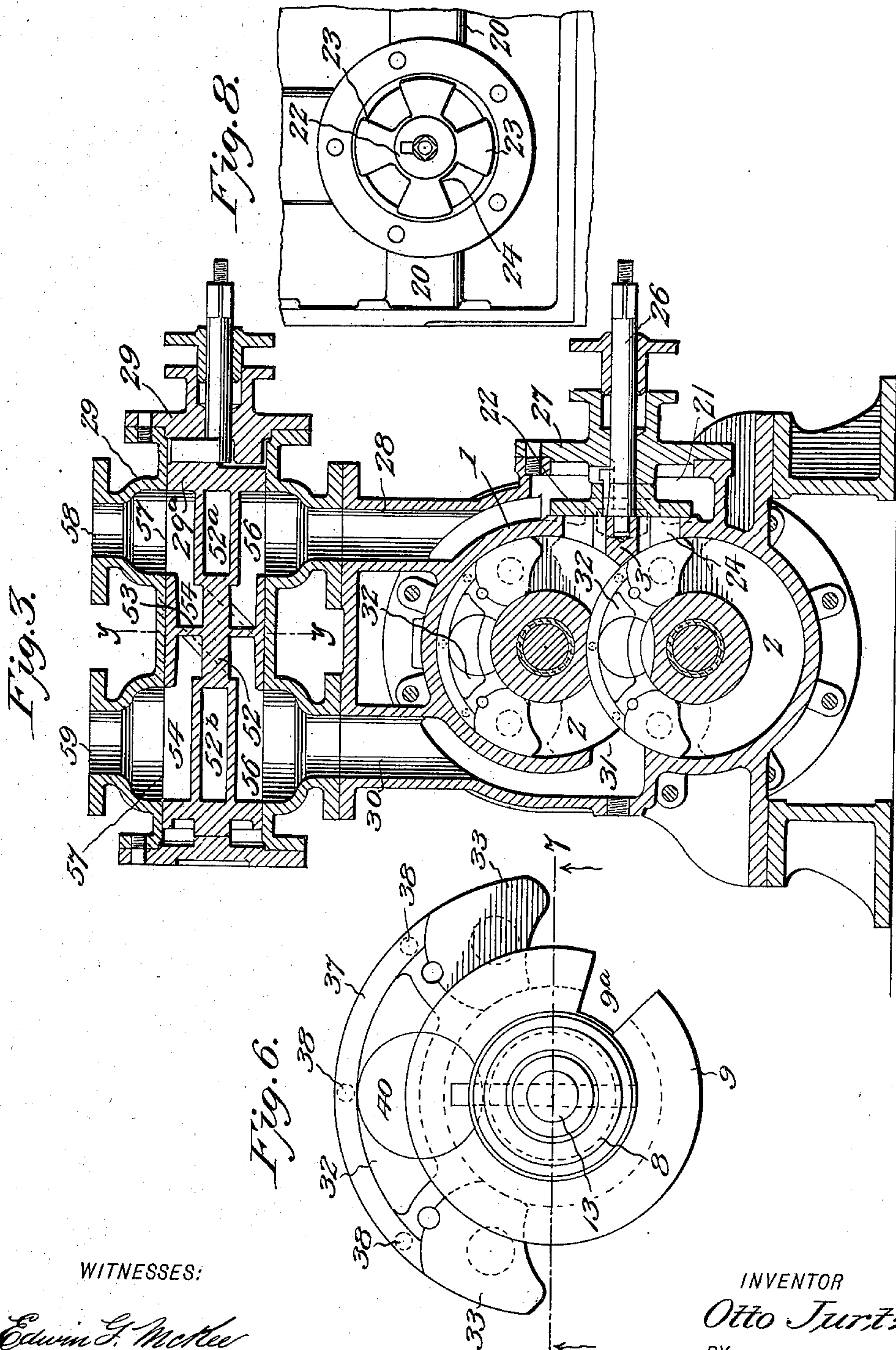
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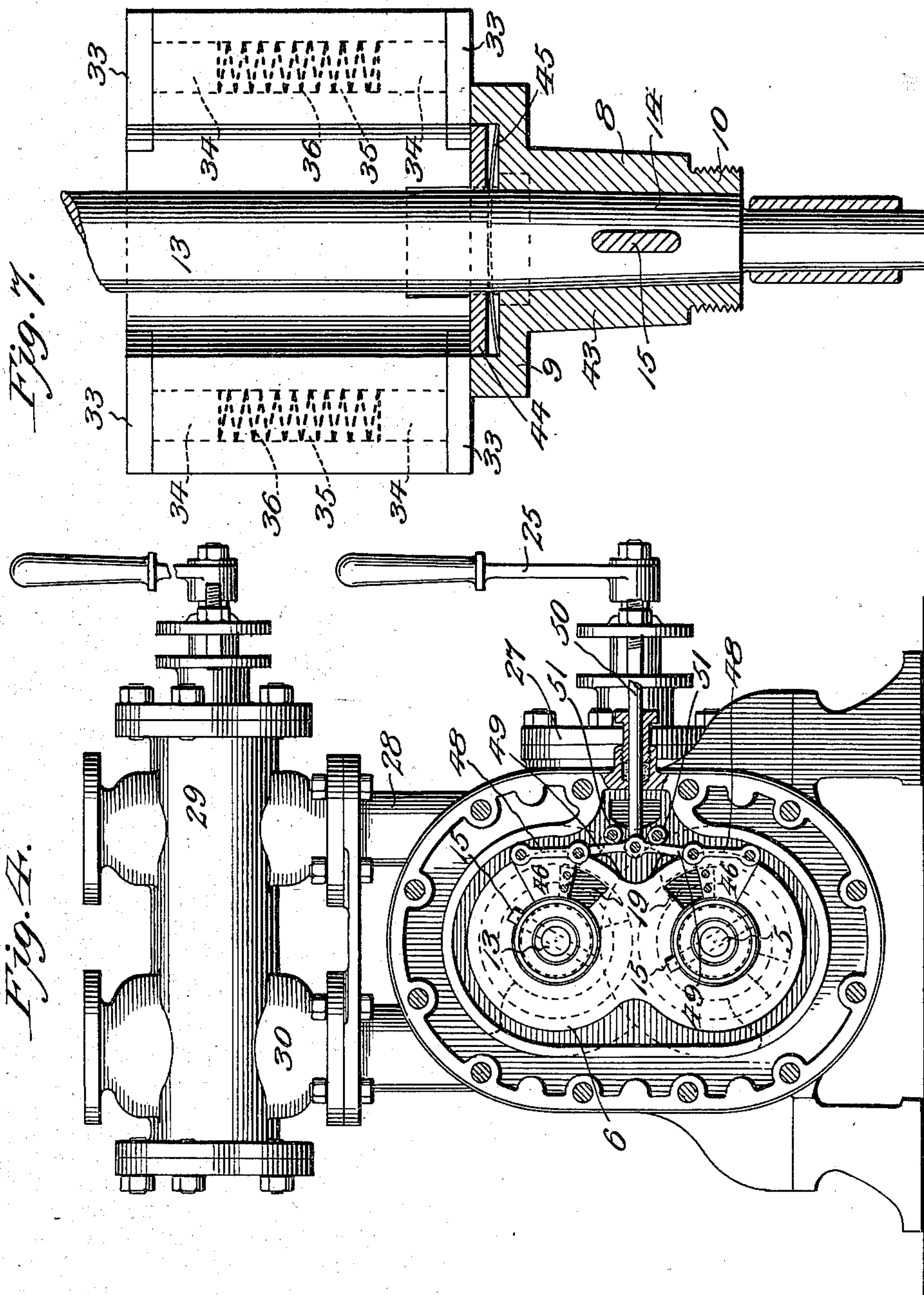
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UNITED STATES PATENT OFFICE.

OTTO JURTZ, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO NICHOLAS KRIBS, OF CHICAGO, ILLINOIS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 734,882, dated July 28, 1903.

Application filed January 28, 1903. Serial No. 140,917. (No model.)

To all whom it may concern:

Be it known that I, OTTO JURTZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to new and useful improvements in rotary engines adapted to be
10 driven by steam, air, or similar power; and its object is to provide pistons of peculiar construction which are connected in a novel manner to the shafts of the engine and are provided with packing suitably arranged to
15 prevent leakage.

Another object is to employ valve mechanism whereby the engine may be started under full pressure, after which the inlet-port is closed and power introduced in smaller quantities through ports arranged at the side of
20 the casing of the engine.

With the above and other objects in view the invention consists in the novel construction and arrangement of the several parts,
25 which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of the engine. Fig. 2 is a central vertical longitudinal section therethrough. Fig.
30 3 is a transverse section on line *x x* of Fig. 1. Fig. 4 is an end elevation of the engine with the end plates and gears removed. Fig. 5 is an enlarged section through a piston and showing the means for connecting the same
35 to a cone. Fig. 6 is an end elevation of the parts illustrated in Fig. 5. Fig. 7 is a section on line 7 7 of Fig. 6 and showing the shaft in plan view. Fig. 8 is an end elevation of the valve of the starting mechanism, the head of
40 the casing of said valve being removed. Fig. 9 is a detail view of the key employed for securing a piston to its cone. Fig. 10 is a section on line *y y*, Fig. 3. Fig. 11 is a detail view of a slide-closure.

45 Referring to the figures by numerals of reference, 1 is the casing of the engine, having two substantially cylindrical chambers 2 therein which communicate and each of which is separated into two similar compartments
50 or cylinders by means of a vertical partition 3, arranged centrally within the casing 1. A

horizontally-arranged tubular casting 4 extends in opposite directions from the partition 3 at the center of each chamber 2, and within each of these castings is journaled a
55 shaft, the lower one, 5, of which is adapted to be connected in any suitable manner to the machinery to be driven. The outer ends of the chambers 2 are closed by heads 6, having apertures 7 therein within which are jour-
60 naled cones 8, having shoulders 9 at their inner ends which extend in rear of said heads 6, and provided at their outer ends with reduced threaded portions 10. An aperture or recess 9^a is formed in each shoulder 9.
65 The threaded portions are adapted to receive nuts 11, which serve to clamp gears 12 upon the cones 8, and as said gears mesh the lower shaft 5 and the upper shaft 13 are moved in
70 unison. That portion of each shaft which is arranged within the cones 8 is tapered, as shown at 14, and is secured to the cone preferably by means of a key 15. The reduced
75 ends of the upper shaft 13 and of shaft 5 are journaled within boxes 16, located within end plates 17, which are so shaped as to extend over the cones and gears and are bolted to the heads 6. A compartment 18 is formed
80 between each head 6 and end plates 17 and is adapted to communicate with the adjacent chambers 2 through ports 19 and apertures 9^a. The steam or other motive agent employed is admitted to these compartments 18 through pipes 20, which extend from opposite
85 sides of a steam-chest 21, located, preferably, at the center of the front of the engine. This chest contains a rotary valve 22, having, preferably, four laterally-extending blades 23, which can be turned into position over a corresponding number of inlet-ports 24, arranged
90 within the inner wall of the chest and opening into each of the four compartments or cylinders 2 of the engine. The valve 22 may be operated in any desired manner, as by means of a lever 25, arranged at the end of a
95 stem 26, which is secured to the center of said valve and journaled within the head 27 of the steam-chest. The end of this stem may, if desired, be mounted within the central partition, 3 heretofore referred to. Steam or other
100 motive agent is admitted to the chest 21 through a pipe 28, which extends downward

from a steam-chest 29, located above the engine and adapted to be closed by a suitably-arranged valve 29^a, located therein. This valve also extends into an exhaust-pipe 30, extending from an exhaust-port 31, which is centrally located intermediate the four cylinders 2. The valve 29^a has a longitudinally-extending partition 52 therein, provided with passages 52^a and 52^b, adapted to register with the inlet-pipe 28 and exhaust-pipe 30. A transverse partition 53 forms four compartments at the sides of partition 52, and the upper ones 54 do not communicate, but open through ports 55 into the compartments 56 at the other end of the valve. Each compartment 54 and 56 has an inlet 57, adapted to register with an inlet or outlet to or from the chest 29, and it will be seen, therefore, that when it is desired to reverse the engine the valve can be so turned as to direct the motive fluid from supply-pipe 58 to pipe 30 and from pipe 28 to outlet-pipe 59.

A piston 32 of peculiar construction is arranged within each of the cylinders 2. This piston is substantially semicylindrical in form and is adapted to revolve upon the cylindrical casting 4, heretofore referred to. Each end of the piston is provided at opposite sides with heads 33, having arms 34 extending inwardly therefrom into a recess 35, extending transversely through the piston. A spring 36 is interposed between these arms and serves to press the heads downward into contact with the sides of the cylinder and prevents leakage of the motive fluid past the pistons during the operation of the engine. Curved packing-strips 37 are located along the sides of the pistons intermediate the heads 33 and are also adapted to be pressed laterally into contact with the sides of the cylinders 2 by coil-springs 38, located within recesses 39, formed within the sides of the pistons. The pistons are connected to the cones 8, before referred to, by means of a key of peculiar construction. This key I have illustrated in Fig. 9, and the same comprises substantially semicylindrical oppositely-extending heads 40, connected by an intermediate strip 41. One of these heads is adapted to be seated in a recess 42, formed in the outer end of the piston 32, while the other head extends inward into a recess 43, formed within the inner end of the cone 8. It will thus be seen that it is impossible for the piston to revolve about the central casting 4 without turning the cone 8 therewith, and as this cone is secured to either the shaft 5 or 13 said shaft and its piston will rotate in unison.

Rings 44 are preferably interposed between the ends of the central castings 4 and the cones 8 and are pressed against said castings by suitable springs 45. These rings serve to prevent the leakage of the motive fluid from the cylinders 2.

Located in each compartment 18 are slides 46, each of which has a lug 47 thereon adapted to fit within an aperture 19 and guide its

plate thereover. A link 48 is pivoted to each slide 46, and these links are connected, by means of links 49, to the inner end of a rod 50, slidably mounted in the casing of the engine. Rollers 51 are located in the compartment 18 at opposite sides of the rod 50 and form bearings or roller-fulcrums for the links 49. When rod 50 is drawn outward, the links 49 travel on rollers 51 and impart motion through links 48 to slides 46, which are moved over the apertures 19 and regulate the size of or close the opening, as desired. By pressing the rod inward the movement of the slides is reversed. With this arrangement the amount of motive fluid supplied to the pistons via the apertures 19 is readily regulated.

In operation the valve 29^a is opened and the steam is admitted to the chest 21 through pipe 23. The engine is then started by turning the valve 22 and opening the series of ports 24. The motive fluid is then permitted to pass directly into four cylinders 2, and the pistons are forced to rotate therein. As the shafts to which the pistons are connected are provided with meshing gears, it is obvious that these pistons will always be retained in the same relation to each other. After the engine has been started it becomes unnecessary to employ the full pressure of the motive fluid, and the valve 22 can then be closed and the fluid will pass through the pipes 20 into the end compartments 18 of the engine. As the cones 8 and their shoulders 9 revolve, the apertures 9^a will register with the ports 19 once during each revolution, and the motive fluid will thus be directed into the several cylinders 2.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make all such changes as fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. In an engine of the character described, the combination with a cylinder having an integral cylindrical casting in the center thereof, of a recessed piston slidably mounted upon said casting, a cone secured upon the shaft and bearing within one head of the cylinder, said cone having a recess therein, a key interposed between the cone and piston, and oppositely-extending heads upon the key seated within the recesses of the piston and the cone respectively.

2. In an engine of the character described, the combination with a casing having communicating cylinders therein, and a rotary piston within each of said cylinders, of a steam-chest, ports extending therefrom and opening into each of the cylinders, a rotary valve adapted to open or close said ports simultaneously, an exhaust-port to each cylin-

der, inlet-ports at the ends of the cylinders, means for directing motive fluid from the steam-chest to said end ports, and a valved supply-opening into the steam-chest.

5 3. In an engine of the character described, the combination with a casing having communicating cylinders therein, and a centrally-located cylindrical casting within each cylinder; of a semicylindrical piston slidably
10 mounted upon each of said castings, a shaft journaled within each of the castings, meshing gears keyed to the shafts, whereby said shafts and pistons rotate in unison, an end plate inclosing the gears and forming a com-
15 partment, ports connecting said compartments to the interior of the cylinders, a slide

upon each port and in the compartment adjacent thereto, a guide therefor, a sliding rod, a link connection between said rod and the slides in one compartment, and roller-bear- 20 ings for the links.

4. The combination with a cylinder and an inlet-port to said cylinder; of a slide, a guide-lug thereon slidably mounted in the port, a sliding rod, a link connection between the rod 25 and slide, and a roller-bearing for the link.

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

OTTO JURTZ.

Witnesses:

WILLIAM A. NARTEN,
CHARLES MUELLER.