

No. 700,243.

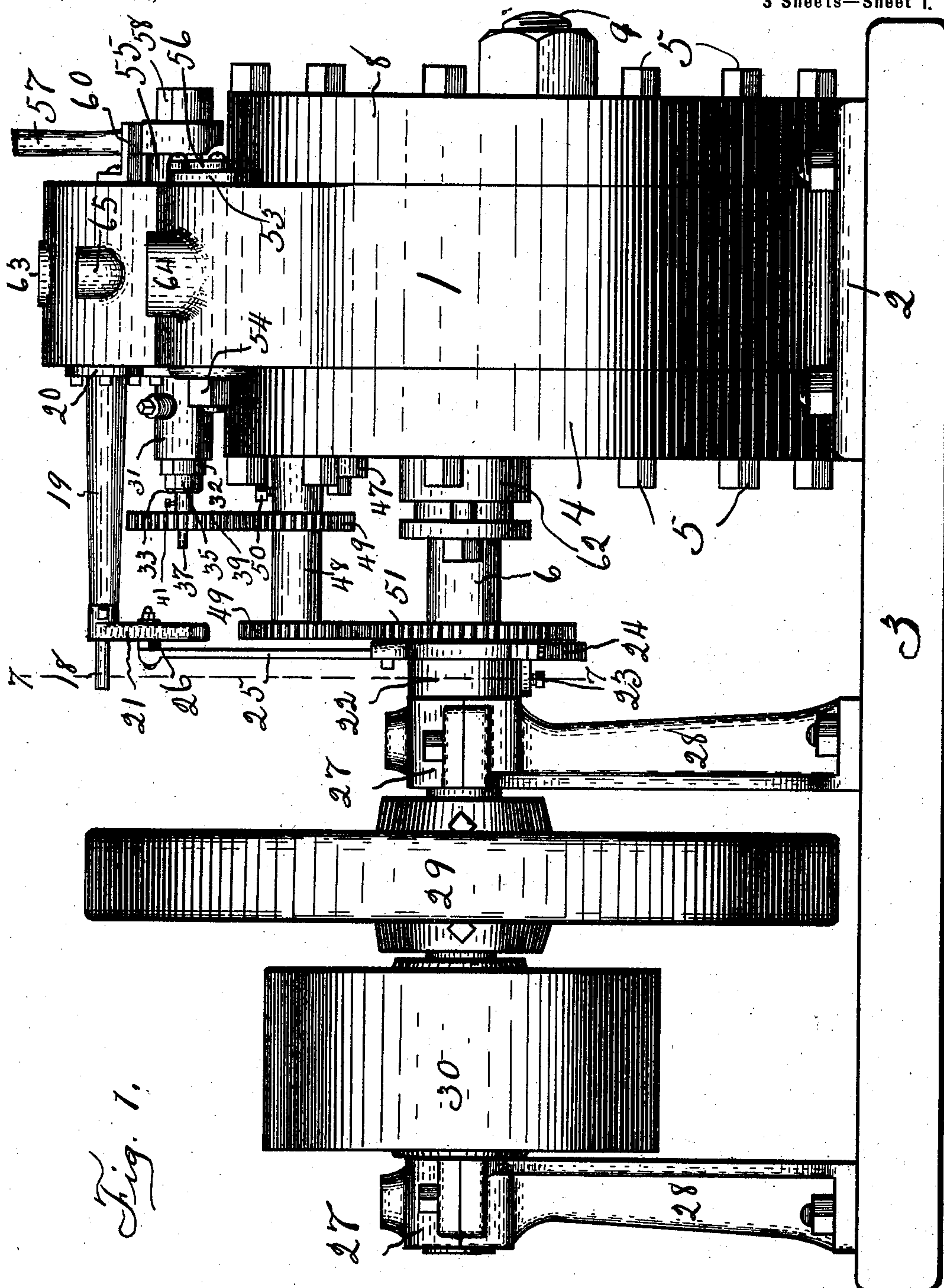
Patented May 20, 1902.

S. S. ROSE.
ROTARY EXPLOSIVE ENGINE.

(Application filed Mar. 20, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
Melroy H. Haynes.
V. A. Webster

Inventor
Samuel S. Rose
By Joshua B. Webster.
Attorney

No. 700,243.

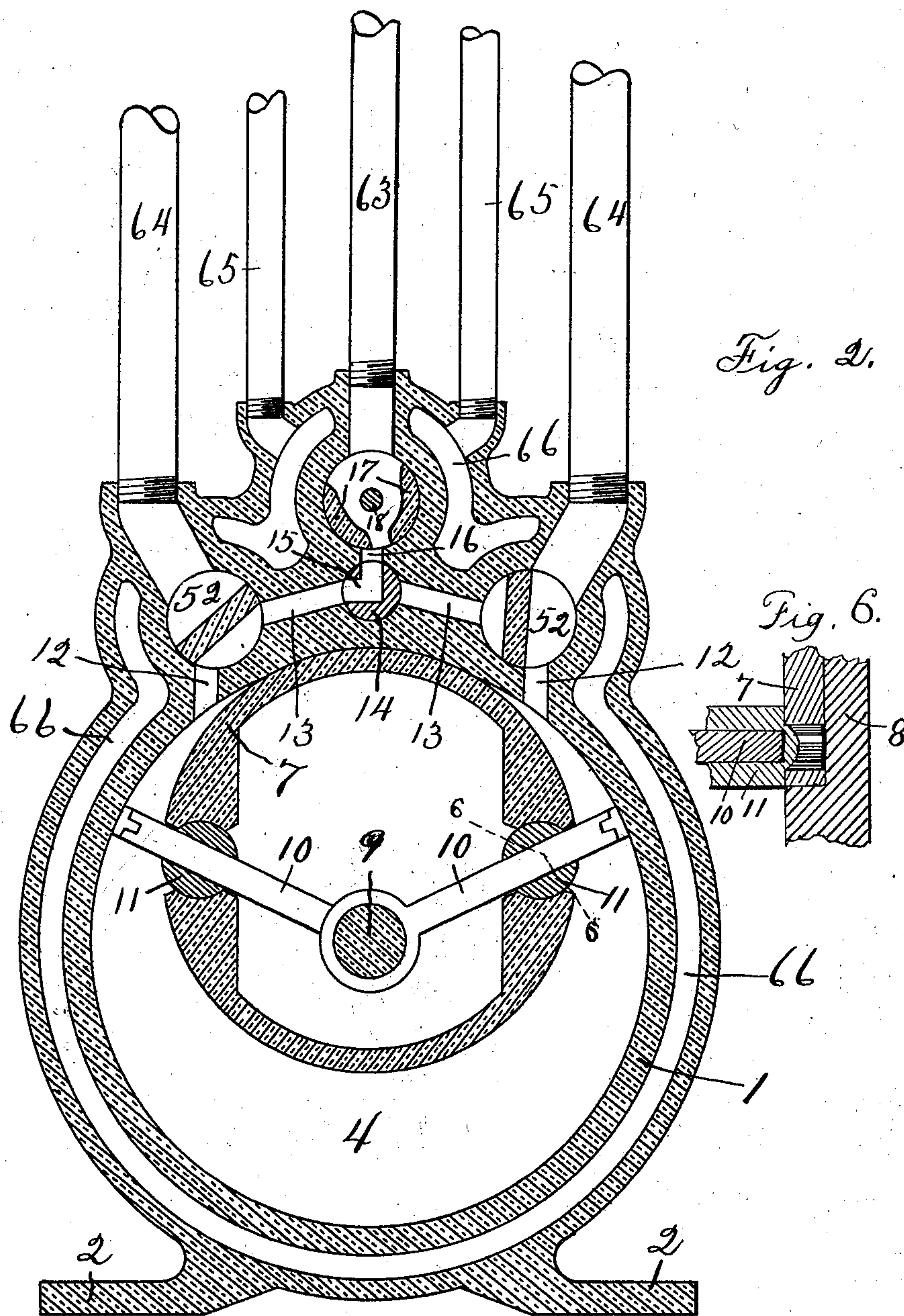
Patented May 20, 1902.

S. S. ROSE.
ROTARY EXPLOSIVE ENGINE.

(Application filed Mar. 20, 1899.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses
Molby Wainnes.
V. A. Webster

Inventor
Samuel S. Rose
By Joshua B. Webster
Attorney

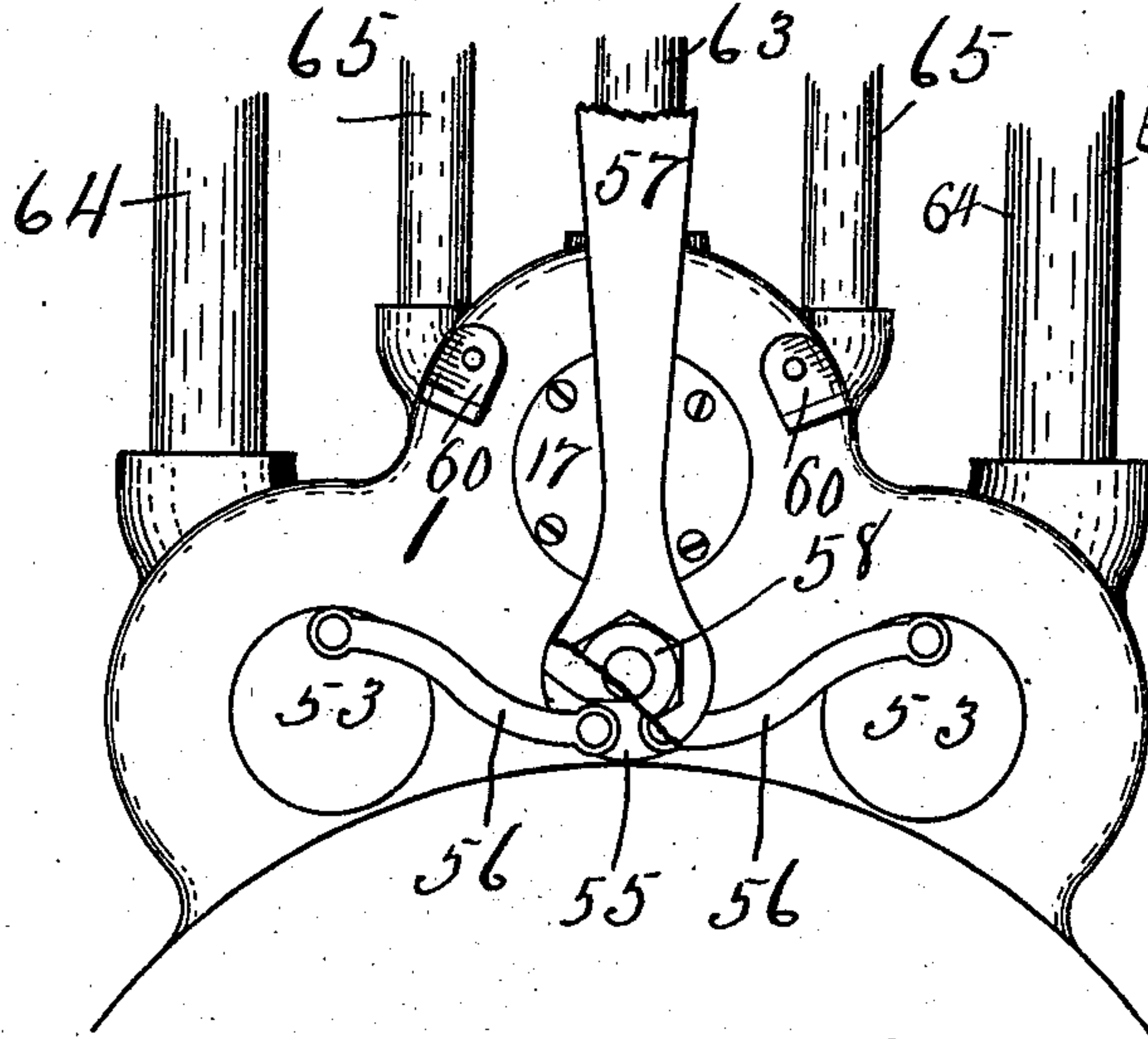
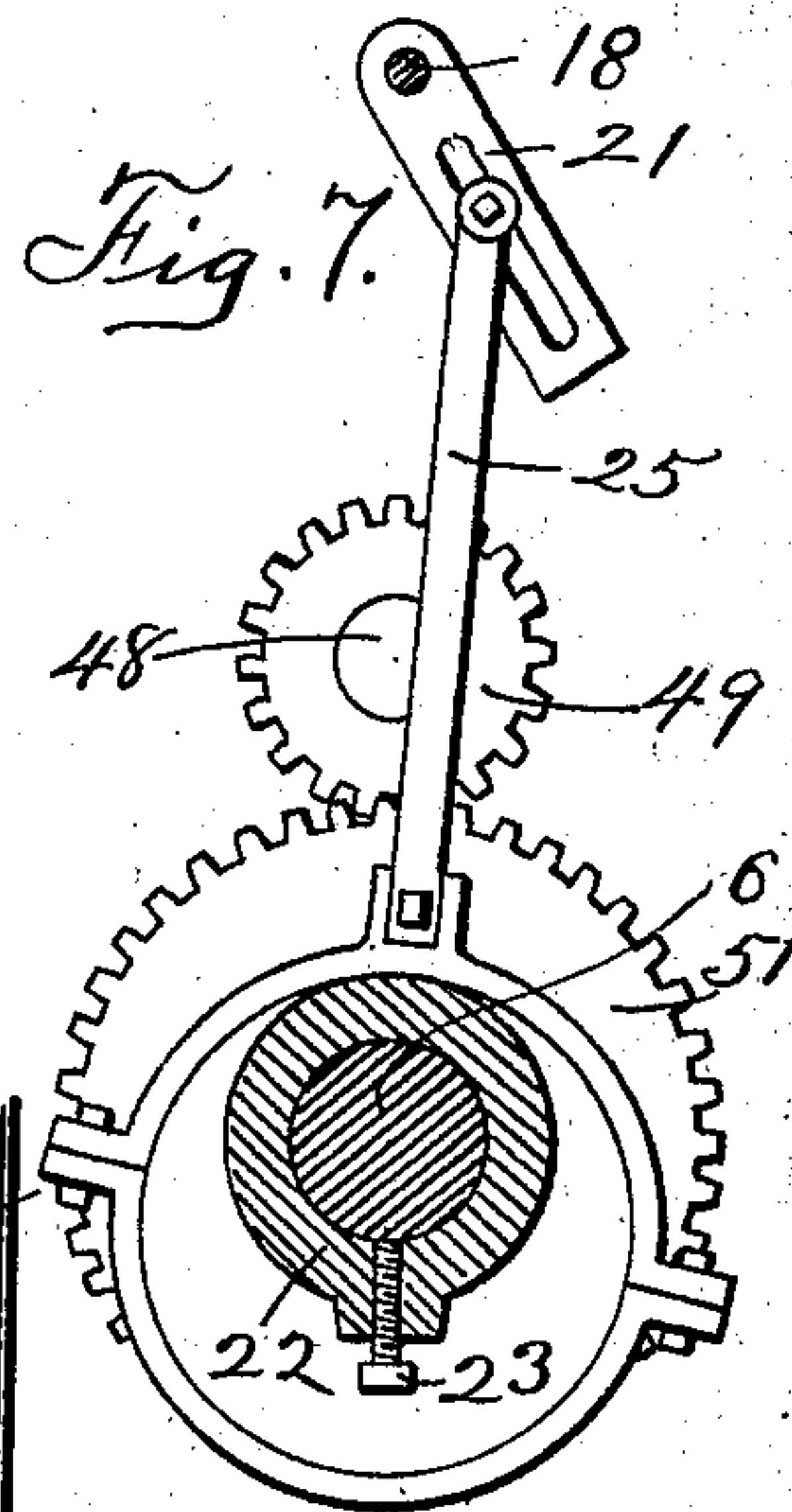
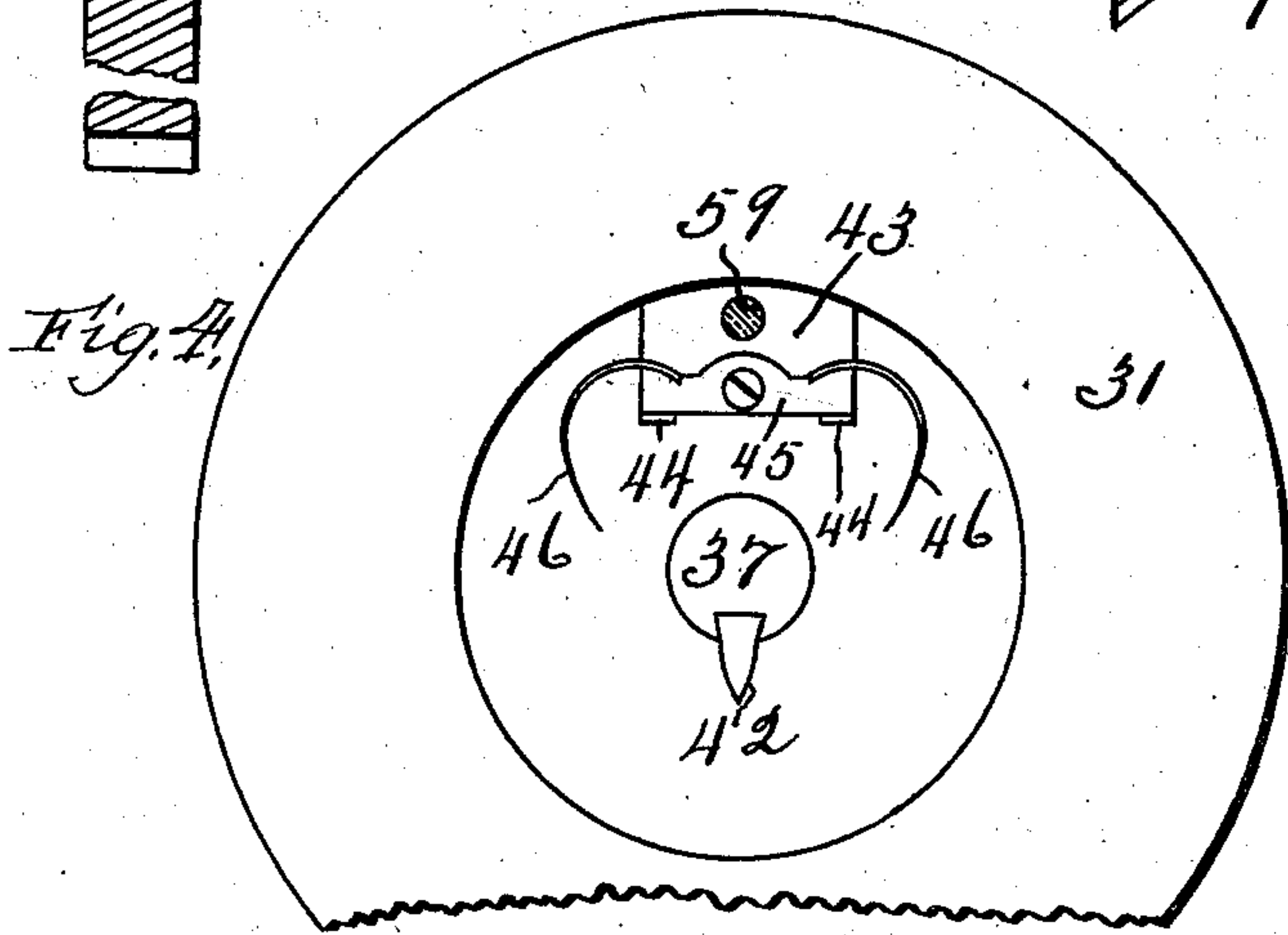
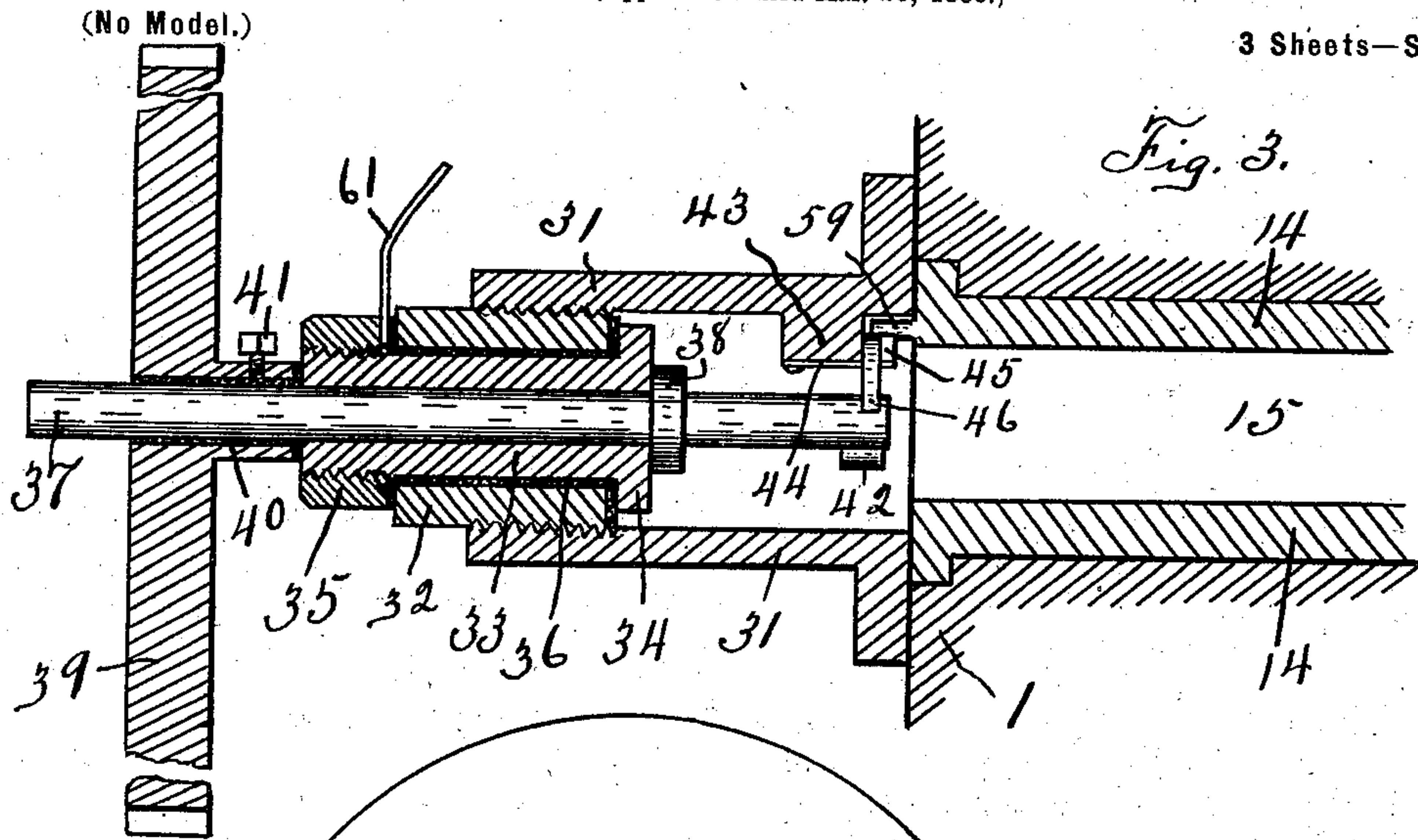
No. 700,243.

Patented May 20, 1902.

S. S. ROSE.
ROTARY EXPLOSIVE ENGINE.

(Application filed Mar. 20, 1899.)

3 Sheets—Sheet 3.



Witnesses
Malby H. Hayes
V. A. Webster

Inventor
Samuel S. Rose
By Joshua B. Webster
Attorney

UNITED STATES PATENT OFFICE.

SAMUEL S. ROSE, OF AMADOR CITY, CALIFORNIA.

ROTARY EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 700,243, dated May 20, 1902.

Application filed March 20, 1899. Serial No. 709,700. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. ROSE, a citizen of the United States, residing at Amador City, in the county of Amador and State of California, have invented certain new and useful Improvements in Combination Steam and Gas Engines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in combination steam and gas rotary engines; and my object is to furnish a rotary engine which may be propelled by means of consecutive explosions of gas, gasolene, naphtha, crude oil, &c., or by means of steam-power. This I accomplish by means of the peculiar construction, novel combination, interchangeability, and adaptation of parts hereinafter described, and particularly pointed out in the claim hereunto annexed, reference being had to the accompanying drawings for a better understanding hereof, in which—

Figure 1 is a side elevation of my improved engine. Fig. 2 is a vertical cross-section of the cylinder, piston, and valves from the rear. Fig. 3 is a vertical longitudinal section of the spark device. Fig. 4 is an end view of the same. Fig. 5 is a front end elevation of the valves and levers. Fig. 6 is a detail section taken in the plane indicated by line 6 6 of Fig. 2. Fig. 7 is a detail section taken in the plane indicated by the line 7 7 of Fig. 1.

Similar figures of reference indicate corresponding parts in the several views.

A circular cylinder 1, having legs or braces 2, is rigidly attached, by means of such braces 2, on a suitable foundation 3 in conjunction with suitable screws or bolts which are inserted in the said braces 2. A cylinder cover or head 4 is rigidly secured to the rear side of the cylinder 1 by means of screw-bolts 5. The main driving-shaft 6 is inserted eccentrically in the face of the cover or head 4 in a vertical line above the center of such head 4. The inner end of the said shaft 6 is rigidly attached to the center of the end of a re-

volving piston 7, which is adapted to fit against the upper concave side within the cylinder 1, so as to prevent the passing of steam or the explosive mixture between the parts. On the front side of the cylinder 1 a cover or head 8, similar to the head 4, is rigidly attached by means of the screw-bolts 5. In the center of the head 8 a wrist-pin 9 is rigidly maintained which is adapted to receive operating-abutments 10, which are formed in the shape of a hinge or knuckle joint, and their free or outer ends are inserted through slots in oscillating bearings 11, which are pivotally journaled in the ends on opposite sides of the said piston 7.

The cylinder 1 has an interchangeable live and exhaust port 12 on either side of the piston 7 near the top of said cylinder, and said ports 12 are connected by means of passages 13. Midway between the ports 12 a three-way rocking valve 14 is inserted in an opening transversely in the cylinder 1 and intersecting the passages 13. The valve 14 has an angular port 15 therein, which is arranged in one position to connect one of the passages 13 with a passage 16 located immediately above said valve and in another position to connect the other passage 13 and passage 16. The passage 16 is connected to and communicates with an oscillating cut-off located transversely in the top of the cylinder 1 and composed of the valve 17, which, as shown in cross-section, Fig. 2, has its top and center cut away, with a slot in the bottom side wherewith the supply of motive mixture may be cut off as the valve 17 is oscillated, and a stem 18, rigidly attached concentrically in said valve 17 and extending rearwardly through a thimble 19, provided with a collar or flange 20 and attached to the rear side of the cylinder by means of large screws. A slotted arm 21, having an eye therein, is inserted over and rigidly attached to the stem 18 near its outer end.

An eccentric 22 is rigidly attached at a suitable point on the main shaft 6 by means of a set-screw 23. An eccentric-strap 24 receives said eccentric 22 and has an eccentric-rod 25 rigidly attached thereto, which rod 25 extends upwardly and is pivotally secured to a block 26, which is adjustably inserted in the slotted arm 21 and has suitable means for securing the same in desired position.

The main shaft 6 is journaled in bearings 27, which are mounted on brackets 28, which are suitably secured on a foundation.

A suitable balance-wheel 29 is rigidly attached to the shaft 6. An ordinary pulley 30 is rigidly attached to the shaft 6 at a suitable point thereon, from which power may be transmitted as desired.

Immediately beneath the thimble 19 an explosion-chamber 31 is rigidly attached to the side of the cylinder 1 by means of suitable bolts. Within the outer end of said chamber 31 a thimble 32 is inserted, preferably by means of a male and female screw-thread. A hollow core 33, having a flange or collar 34 formed on the rear end thereof, is inserted in the thimble 32 and maintained therein by a nut 35, which is screwed on the end of said core and impinges upon the end of the thimble 32. Between the parts of the core 33, its flange 34, and nut 35 and the thimble 32 suitable insulation 36 is arranged. A shaft 37, having a collar 38 suitably located thereon and adapted to engage with the inner end of the core 33, is inserted in said core 33, with one end protruding therefrom and adapted to receive a cog-wheel 39 thereon, which is separated therefrom by suitable insulation 40 and rigidly attached thereto by a suitable set-screw 41. The inner end of the said shaft 37 has a lug or boss 42 rigidly attached to the same. A lug 43 is attached to the upper side within the explosion-chamber 31 near the end of the shaft 37. The under face of the said lug 43 is horizontal and provided with a flat spring 44 on either side, which springs 44 extend beyond said lug 43 and engage with either end of a spring-holder 45, which is pivotally attached to the face of the lug 43. Semicircular springs 46 of suitable length are rigidly attached one on either end of said holder 45, which springs 46 are adapted to be engaged by the lug or boss 42 on the end of the shaft 37.

A socket 47 is rigidly attached at a suitable point immediately below the chamber 31 on the cylinder-head 4. In said socket 47 one end of the journal of a spool 48, bearing a cog-wheel 49 on either end thereof, is inserted and rigidly attached by means of a set-screw 50. One of said cog-wheels 49 is adapted to engage with the wheel 39, and the other engages with a cog-wheel 51, which is rigidly attached to the eccentric 22 concentrically with the shaft 6. The wheel 51 is double the diameter of the wheels 49 and 39 for the purpose of giving the shaft 37 two revolutions to one of the main shaft 6. On either side of the valve 14 transversely in the cylinder 1 and intersecting the passages 13 and ports 12 a rock-valve 52 is inserted, said valves 52 having on the front end a flange 53, which impinges upon the face of the cylinder 1, and the other sides of said valves have flanged nuts 54 attached thereon, which impinge upon the rear side of the cylinder. The valves 52 are formed by having a portion of the convex

surface removed near the center on opposite sides, as shown in Fig. 2. On the front end of the valve 14 a collar 55 is rigidly secured for the double purpose of preventing the escape of steam or explosive mixture and for the operation of rocking levers 56, which are attached at one end eccentrically and pivotally on said collar 55, said levers 56 diverging therefrom and having their opposite ends pivotally attached eccentrically to the flanges 53 of the valves 52 for the purpose of rocking or oscillating said valves 52 simultaneously with the operation of the valve 14, which is manipulated by means of a lever 57, which is inserted on the front end and attached thereon by means of a nut 58.

The rear end of the valve 14 has an opening from the slot 15 communicating with the explosion-chamber 31. A pin or lug 59 protrudes from the upper edge of the valve 14 into the explosion-chamber 31 immediately above the spring-holder 45, which said lug 59 is adapted to engage as the valve 14 is rocked to and fro. A lever-stop 60 is arranged on and attached to the cylinder 1 on either side of the lever 57. Suitable electrical connection may be made with the core 33, as by the wire 61, and to any other convenient part of the engine. A suitable stuffing-box 62 is provided for the cylinder-head 4 at the entrance of the shaft 6 therein.

63 represents a steam or explosive-mixture supply pipe communicating with the cut-off valve 17 and is adapted to conduct motive material to the cylinder. An exhaust-pipe 64 is arranged on either side to conduct the exhaust from the valves 52 as is desired. Pipes 65 are arranged on either side of the pipe 63 for the purpose of conducting water to and from the water-chamber 66, which is arranged with a partition transversely across the top, so as to compel the circulation of the water completely around the cylinder.

The mode of operating my improved combination steam and gas engine is as follows: All the parts having been properly adjusted, the lever 57 is thrown to the right against the lever-stop 60, which movement by means of the levers 56 rocks or tilts the valves 52 into the position shown in Fig. 2, wherein the steam or other motive mixture may be admitted through the pipe 63, cut-off 17 18, passages 16 and 13, angular passage 15 in the valve 14, the valve 52 at the left in Fig. 2, and the port 12 into the cylinder and against the abutments 10, where, if steam be used, its power is exerted in the usual manner, and when the abutments have been forced around the exhaust-steam escapes through the other port 12 to the right of Fig. 2 and is conducted as desired by the pipe 64. If gas, naphtha, gasolene, or other explosive vapor is used, the same enters in the same manner as steam until the piston 7 and its abutments 10 reach a certain point in their revolution, whereupon the cut-off valve 17 18, being oscillated by the eccentric 22, rod 25, and arm 21, shuts

off the passage 16, thereby shutting said explosive vapor in the cylinder 1. The wheels 57 49 39, the shaft 37, and lug 42 having been properly adjusted, said lug 42 engages and
 5 disengages the spring 46, while the passage 16 is cut off by the valve 17 18, which by means of an electric current causes a spark and consequent explosion of the vapor within the cylinder, which causes the revolution of the piston 7 and shaft 6. The tilting of the lever 57
 10 and rotation of the valve 14 cause the pin or lug 59 to engage with one end of the spring-holder 45, thereby depressing that end of said holder 45 and causing the spring 46 on that
 15 end to engage with the lug 42, as hereinbefore described. By arranging the lever 57 in neutral position, as shown in Fig. 5, the lug 59 assumes the position shown in Fig 4 and the springs 44 force the spring-holder 45 into
 20 neutral position, whereupon the lug 42 may revolve without an electrical contact. When the lever 57 is reversed, the pin or lug 59 engages the reverse end of the spring-holder 45, causing the reverse-spring 46 to come in con-
 25 tact with the lug 42. The valve 14 communicates with the passage 13 on the other side, and the valves 52 by means of the levers 56 are reversed in position, changing from an exhaust to a live port, and vice versa. In this
 30 position the motive material enters the opposite side of the cylinder and the motion of all parts is reversed.

I am well aware that rotary engines have been made which run by steam-power which
 35 comprise a piston arranged eccentrically within the cylinder and are operated by abut-

ments arranged in said piston, and therefore those features I do not claim broadly; but

What I do claim as new, and desire to secure by Letters Patent, is—

The herein-described combined explosive-engine comprising the cylinder, the rotary piston arranged therein, and fixed on a shaft, the passages 12 communicating with the interior of the cylinder at opposite sides of the
 45 piston, the exhaust-passages 64, the passages 13; the said passages 12, 64, and 13, intersecting at common points, the passage 16, the supply-passage 63, for gas, the cut-off valve 17
 50 interposed between the passages 63 and 16, and having a crank on its stem, the explosion-chamber 31, the hollow rocking valve 14 interposed between the passage 16 and the inner ends of the passages 13 and communicat-
 55 ing at one end with the explosion-chamber 31, the rocking valves 52 interposed between the adjacent ends of the passages 12, 13 and 64 and occupying the points of intersection thereof, the eccentric fixed on the piston-shaft, the strap surrounding said eccentric and ad-
 60 justably connected to the crank on the stem of the valve 17, the lever 57 connected with the rocking valves 52, and suitable means for igniting explosive mixture in the chamber 31, all substantially as specified.

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

SAMUEL S. ROSE.

Witnesses:

MOLBRY HAYNES,

JOSHUA B. WEBSTER.