

No. 682,389.

Patented Sept. 10, 1901.

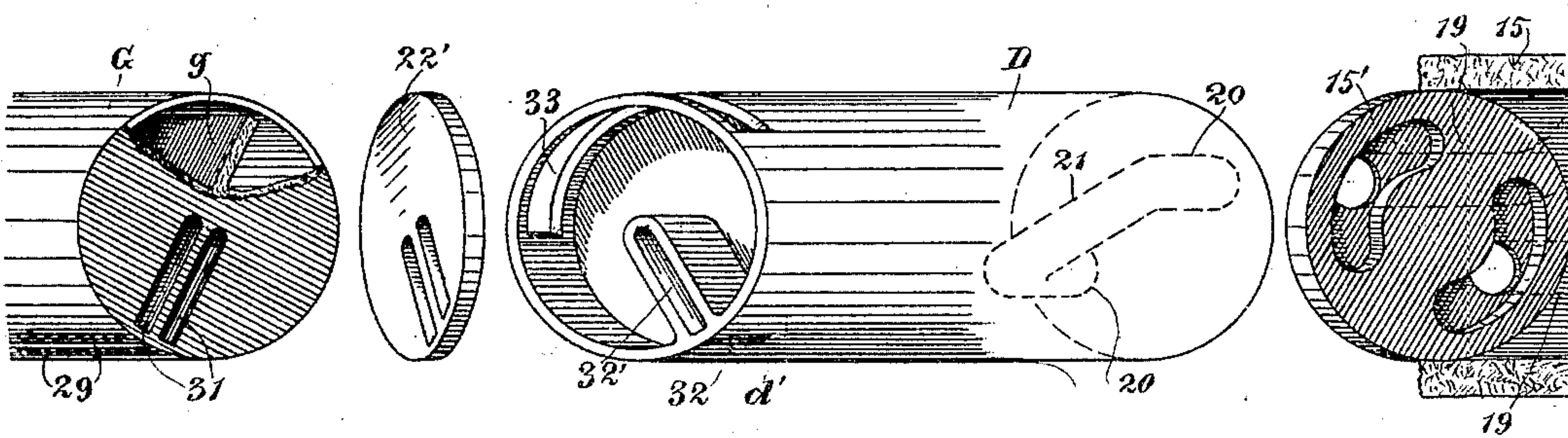
W. K. RILEY.
ENGINE.

(Application filed Jan. 22, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses,
J. F. Ascheck

Inventor
William K. Riley
By Dewey Strong & Co.
attys.

No. 682,389.

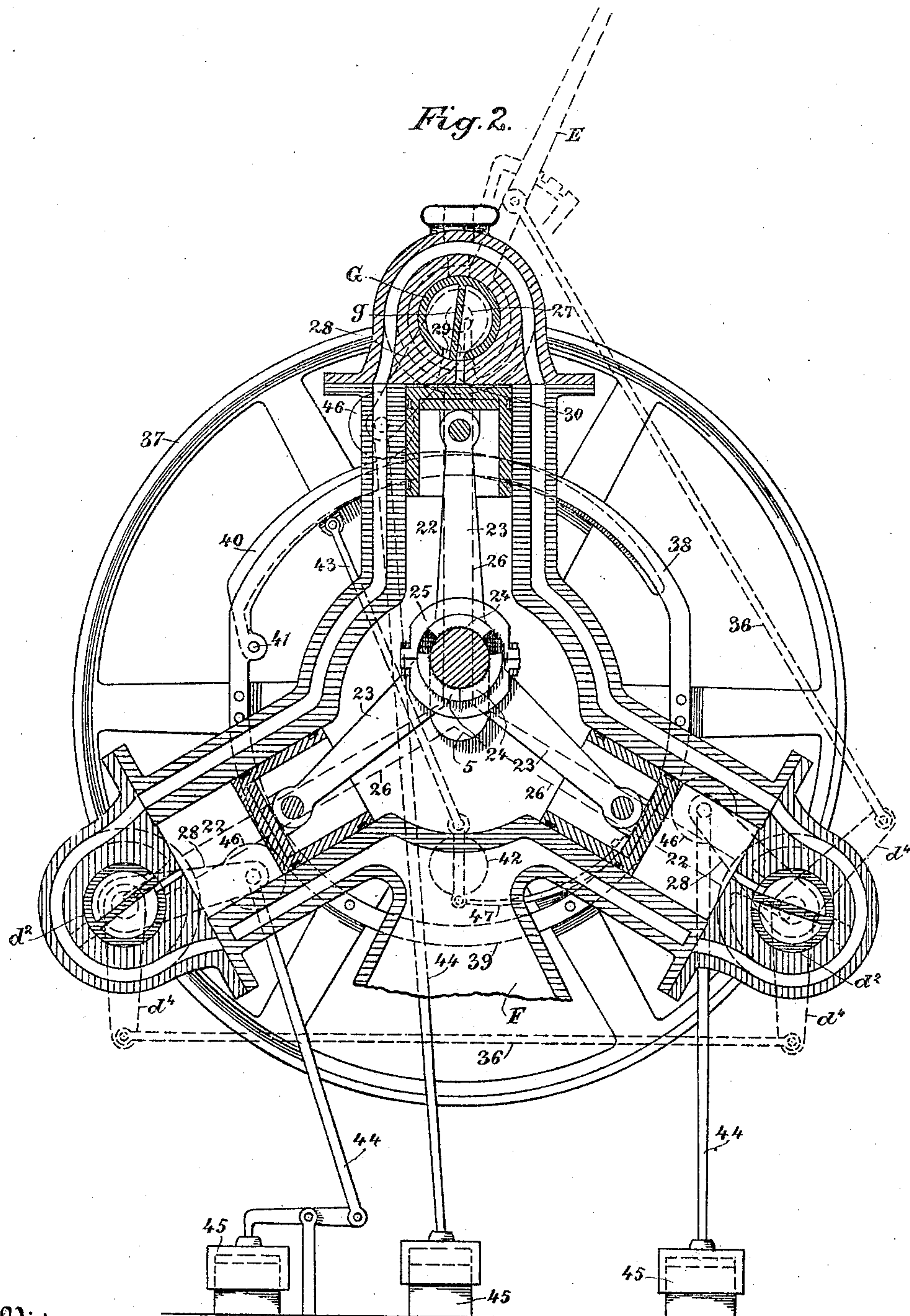
Patented Sept. 10, 1901.

W. K. RILEY.
ENGINE.

(Application filed Jan. 22, 1901.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses,
J. F. Alscheck

Inventor,
W. K. Riley
By Dwyer Strong & Co. atty

No. 682,389.

Patented Sept. 10, 1901.

W. K. RILEY.
ENGINE.

(Application filed Jan. 22, 1901.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 3.

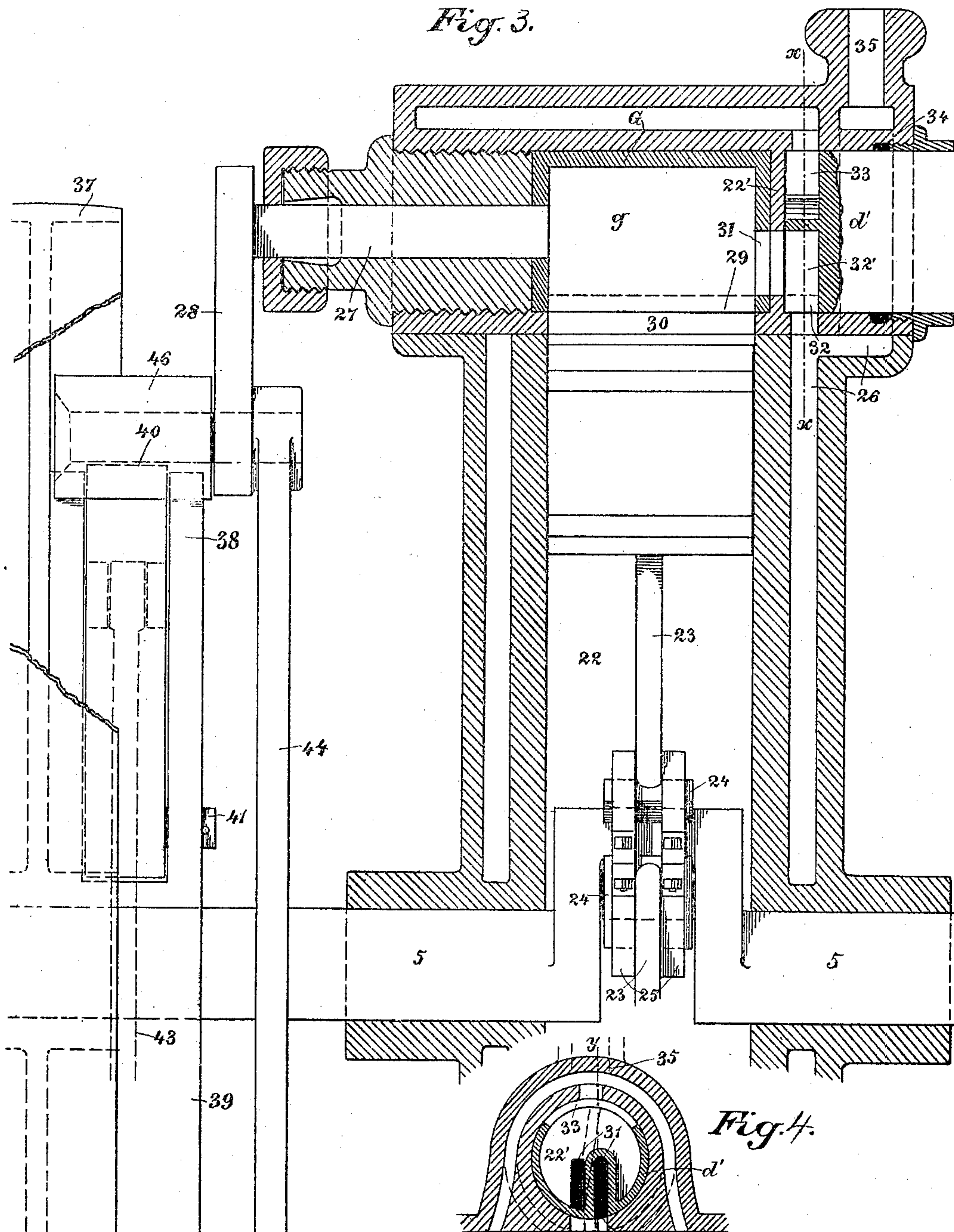


Fig. 4.

Witnesses,
J. H. Morse
J. F. Alscheck

Inventor,
William K. Riley
By Dwyer Strong & Co. Attys

UNITED STATES PATENT OFFICE.

WILLIAM KING RILEY, OF LAKE CITY, COLORADO.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 682,389, dated September 10, 1901.

Application filed January 22, 1901. Serial No. 44,266. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KING RILEY, a citizen of the United States, residing at Lake City, county of Hinsdale, State of Colorado, have invented an Improvement in Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in engines such as are operated by steam or other propelling medium, and has for its object the furnishing of a compact machine in which a single lever controls the starting, stopping, reversing, or running of the engine at any speed and without the aid of the usual eccentrics or links.

It consists in the combination, in an engine having its cylinders radially disposed in relation to a main power-shaft, of oscillating inlet-valves at the outer ends of these cylinders, a governing device by which said oscillation is effected, a controlling-valve in relation to each of said inlet-valves, and means by which said controlling-valves are operated in unison.

It also consists of details which will be more fully hereinafter set forth.

In the accompanying drawings, Figure 1 shows the inlet and reversing valves with connections detached from one another. Fig. 2 is a vertical central section through the engines. Fig. 3 is a partial section through the upper parts of the engines on line *yy* of Fig. 4 and at right angles to Fig. 2. Fig. 4 is a cross-section through the engine-head on line *xx* of Fig. 3.

Having reference to the drawings, F represents the frame of my engine. The cylinders 22 are cast integral with this frame. In these cylinders are the pistons, to which are pivoted the piston-rods 23. The latter are adjustably connected to the crank in the main shaft 5 by means of the rings or straps 25. Each rod is provided with a projection or foot 24, and the rings 25 rest upon these projections. Steam is conveyed to the cylinder through passages 26, formed in the jacket surrounding the cylinders.

At the outer ends of the cylinders are situated the rotatable inlet-valves G. Each of these valves consists of a cylinder having a longitudinal diaphragm *g*, ports 29 on either side of the diaphragm, radial end ports 31, and a stem 27 at the other end of the valve

extending through the cylinder-head casing 55 and terminating in a short crank 28, by which the oscillation of the valve is effected in a manner to be shown later. The ports 29 are adapted to register with the opening 30, leading to the interior of the cylinder. The port 60 end of each of the valves G abuts against a partition 22', in which latter are corresponding radial ports 22^a, with which the ports 31 alternately register by the rotation of the valve. Abutting against the other side 65 of the partition is the controlling-valve *d'*. Similar valves *d''* are arranged in relation to the other cylinders. These valves *d'* *d''* are each provided with a central end opening or chamber 33^a. Communicating with this open- 70 ing through one side of the valve is the exhaust-port 33. Opposite the port 33 is the inlet-port 32, adapted to register with the steam-supply passage 26. A U-shaped partition 32^a incloses this inlet-port and cuts off commu- 75 nication with the chamber 33^a and forms a radial passage 32', which is adapted to register with one or other of the ports 22^a of the partition. These latter ports communicate, as before stated, with the valves G, govern- 80 ing the supply and exhaust to the cylinders. The controlling-valves *d'* *d''* are operated in unison to start, stop, or reverse the engine by means of a single lever E. This lever is se- 85 cured to one of the valves, as *d'*, and connects with the others by means of links 36 and crank-arms *d''* on the valve-stem *d''*.

The live steam enters the feed-passage 26 through the opening 35 and around the valve-seats 34. From the passage 26 it is admitted 90 to the cylinders through the port 32, passage 32', and one or the other of the ports 22^a and corresponding ports 31, 29, and 30. The exhaust will take place through the opposite of the ports 29, 31, and 22^a into the valve-cham- 95 ber 33^a and out through the port 33.

The oscillation of the inlet-valves G is done in the following manner: A fly-wheel 37 is carried upon the end of the shaft 5 of the engine. Upon the spokes of this wheel is at- 100 tached a flange consisting of two conjoined concentric crescents of unequal radius—a larger 38 and a smaller 39. The former is slotted, so as to allow a crescent lever 40, pivoted at 41, to swing therein. Oppositely upon 105 the inner side of the crescent 39 is attached a spring 47, carrying a weight 42, which is connected with the lever 40 by a link 43. The

cranks 28, above referred to, upon the stems of the valves G are held in proper position by means of rods or links 44, connected to springs or dash-pots 45. Steam is only admitted 5 through these valves G and to the cylinders as the crescent lever 40 in the revolution of the fly-wheel strikes a roller 46 upon a crank, lifts the crank, and accordingly rotates the valve. The moment the crescent lever passes 10 from that roller its dash-pot causes the valve immediately to close and shut off the live steam and permit exhaust at the proper instant. The crescent lever protrudes more or less beyond the slot in the flange, according 15 to the speed of the fly-wheel and the centrifugal action of the weight-governor. Consequently the faster the engine runs the less will the lever project and the less will be its effect on the inlet-valves and the greater the 20 tendency to cut off the steam, and vice versa.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An engine consisting in combination of 25 a plurality of fixed cylinders, pistons reciprocating therein and acting upon a shaft, oscillating inlet-valves at the outer ends of said cylinders, means by which such oscillation is effected, a rotatable controlling-valve adjacent 30 to each of said inlet-valves, an inlet and an exhaust port in the end of each controlling-valve, inlet and exhaust ports in the end of each of said first-named valves, means whereby said ports are adapted properly to 35 register, and means whereby said controlling-valves are operated simultaneously to admit or shut off steam to the cylinders.

2. An engine consisting in combination of a plurality of radially-disposed cylinders in 40 the same plane, pistons therein, piston-rods connecting with the crank of a main shaft, said piston-rods having segmental portions bearing upon said shaft and held thereto by straps or rings, oscillating inlet-valves at the 45 outer ends of said cylinders and means for effecting said oscillation, rotatable controlling-valves in axial alinement with said oscillating valves, connections between said oscillating and controlling valves and a lever 50 mechanism whereby said controlling-valves are operated to admit or shut off steam to or from the cylinders.

3. In an engine and in combination with a cylinder thereof, a rotatable inlet-valve consisting of a cylindrical structure having a longitudinal diaphragm, slots on either side of 55 said diaphragm and adapted to register with the port of said cylinder and radial slots at one end of said valve and on either side of 60 said diaphragm.

4. In an engine and in combination with the steam-supply passage thereof, a controlling-valve having a hollowed or chambered end 65 portion, an opening in the wall of said valve into said chamber, a second opening in the wall of said valve and adapted to register with said supply-passage, and radial parti-

tions inclosing said second opening whereby communication with the chamber proper is cut off. 70

5. The combination in an engine of multiple fixed cylinders radially disposed in relation to a shaft, oscillating inlet-valves in the outer ends of said cylinders, means by which 75 said oscillation is effected, each of said valves having a longitudinally-partitioned chamber, ports on either side of said partition adapted to register with an opening into the cylinder, radial ports at one end of said valves, fixed 80 plates or partitions against which the oscillating valves abut, radial slots in said partition with which the ports in the end of said valves are adapted to register, and a controlling-valve in relation to each of said oscillating 85 valves, said controlling-valve having one end abutting against said slotted partition, admission and exhaust ports in said controlling-valve and adapted to register with the slots in said partitions, and means by which 90 said controlling-valves are rotated in unison to start, stop or reverse the engine.

6. In an engine having radially-disposed cylinders, the combination with oscillating inlet-valves at the outer end of said cylinders, of a governor consisting of two conjoined 95 concentric crescents of unequal radius upon the spokes of the fly-wheel, the larger crescent having a slot in which a crescent lever is fulcrumed and movable to or from the center of the wheel, means by which this lever 100 is drawn inwardly by the more rapid revolution of the wheel, and conversely swung outwardly by the slowing of the wheel, and means by which this lever operates to open the inlet-valves on the revolution of the wheel. 105

7. The combination in an engine having a plurality of radially-disposed fixed cylinders, of rotatable inlet-valves in the outer ends of said cylinders, stems upon these valves protruding through the casing, cranks upon these 110 stems, and means by which the valves are kept closed, of a governor upon the fly-wheel on the engine-shaft, said governor consisting of two conjoined concentric crescents of unequal radius upon the spokes of the wheel, 115 the larger crescent having a slot in which is fulcrumed a crescent lever, and which appears or disappears within the crescent by the revolution of the wheel, said appearance and disappearance being controlled by a cen- 120 trifugally-operating weight upon the wheel, said lever adapted to engage with each of the above-mentioned valve-cranks successively in the revolution of the wheel, whereby the said valves are rotated and steam admitted 125 to the cylinders during such engagement of the lever and cranks.

In witness whereof I have hereunto set my hand.

WILLIAM KING RILEY.

Witnesses:

P. C. MCCARTHY,
C. C. MALMSTROM.