No. 820,010. PATENTED MAY 8, 1906.

L. PETTERSON.

GASOLENE MOTOR.

APPLICATION FILED JUNE 6, 1904.

2 SHEETS—SHEET 1.

Fig. 1

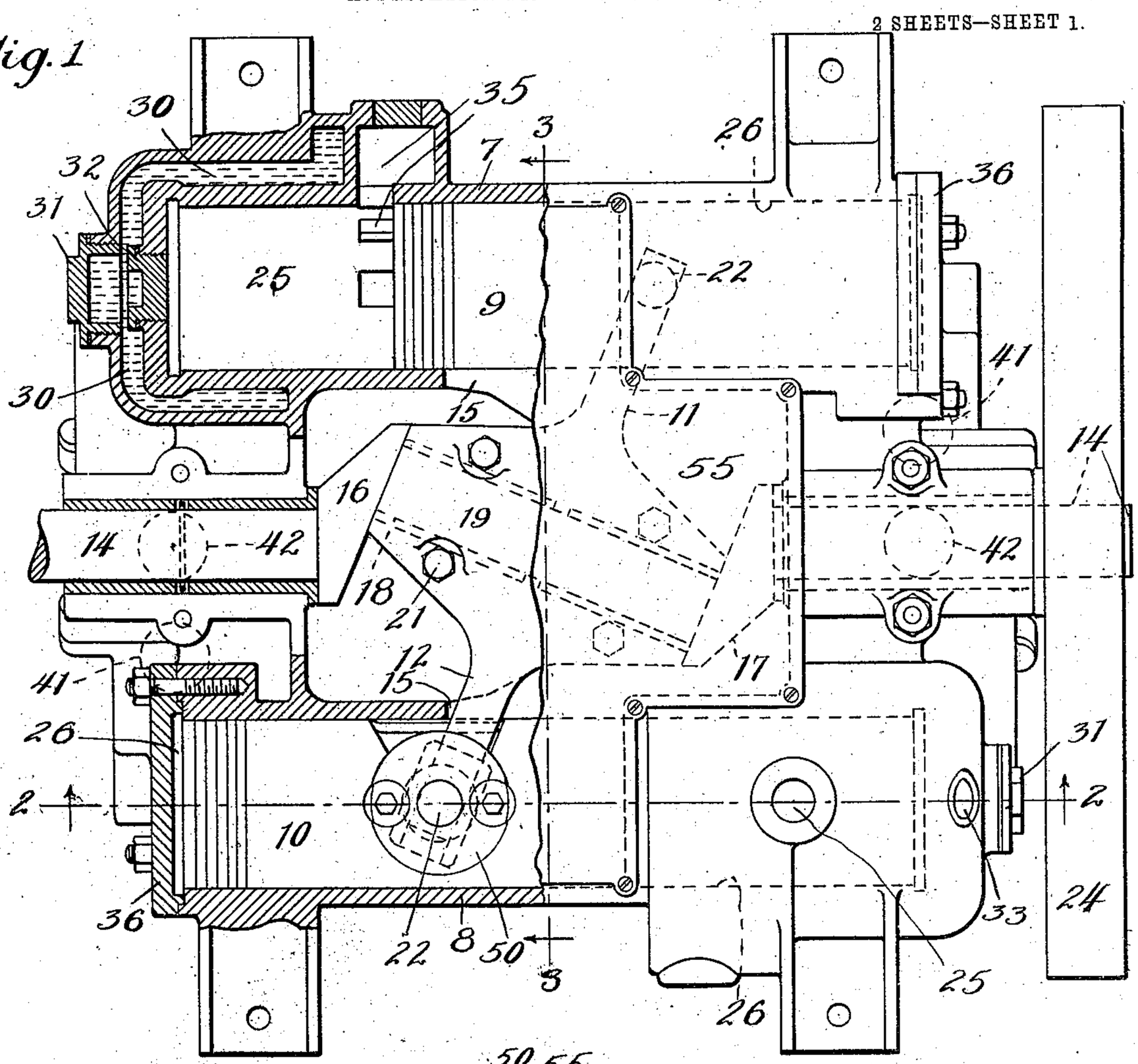
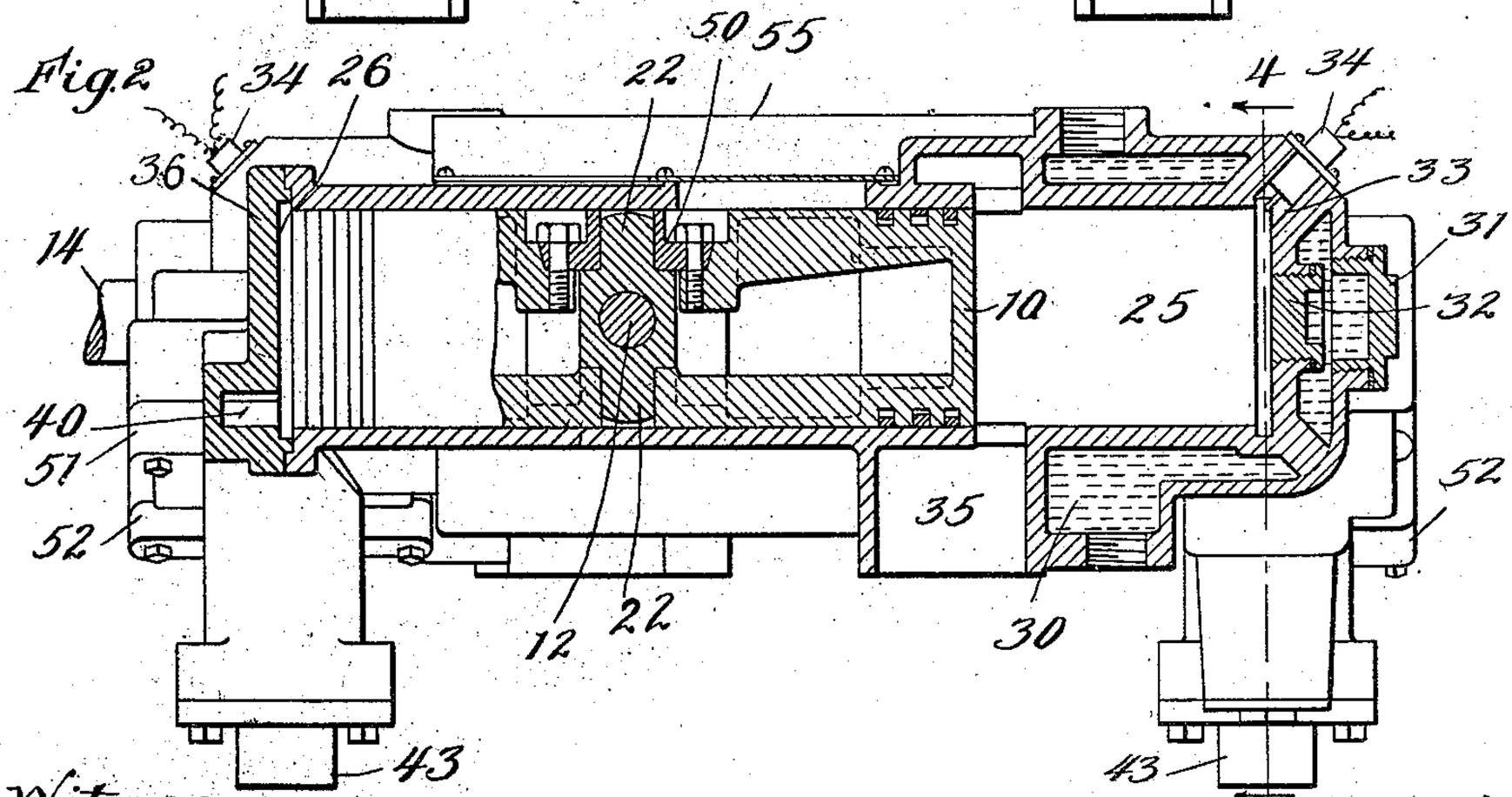


Fig. 2



Witnesses:

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Fig. 3

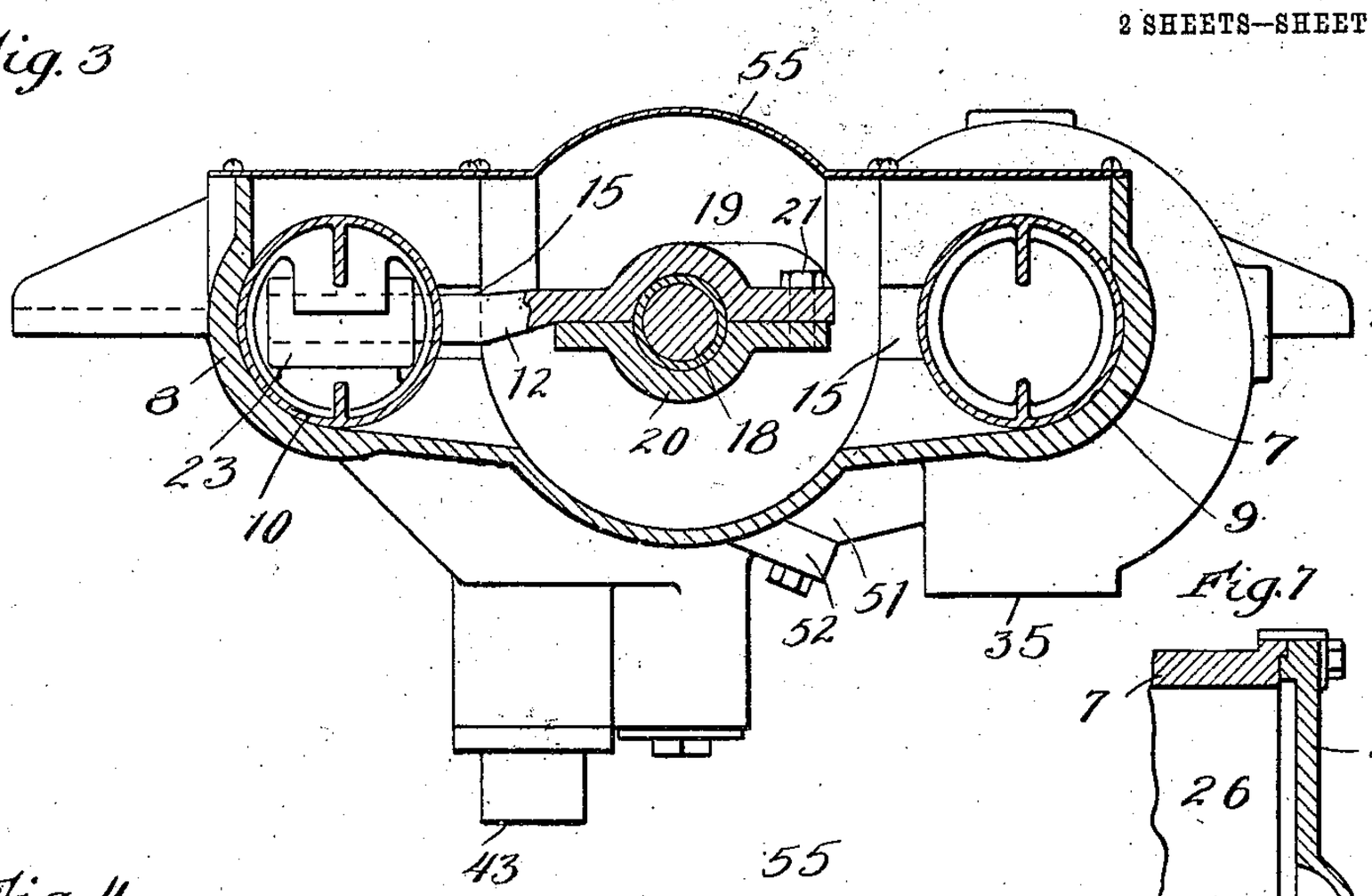


Fig. 7

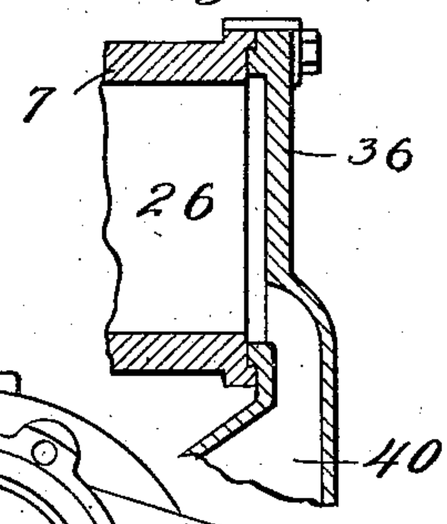


Fig. 4

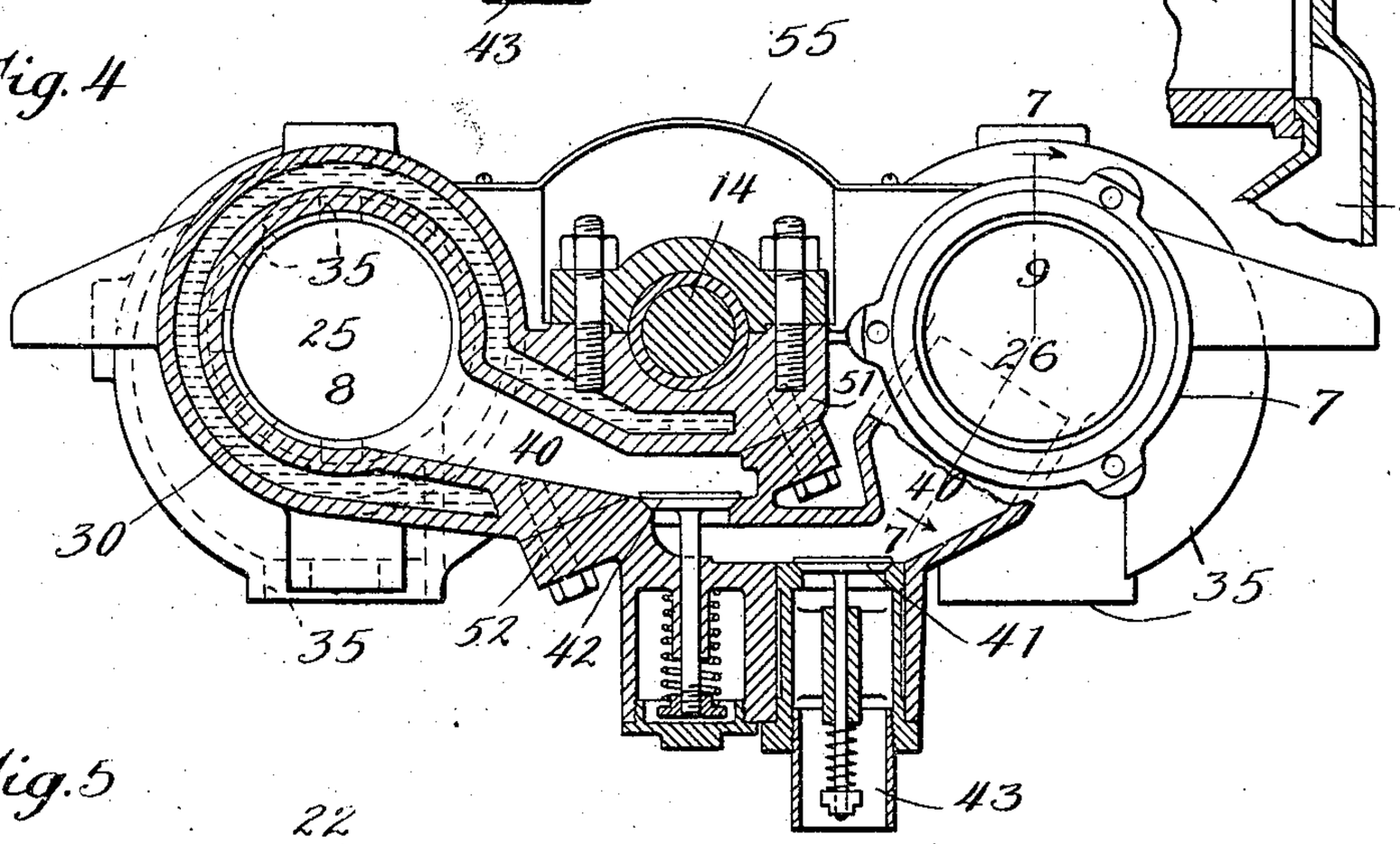


Fig. 5

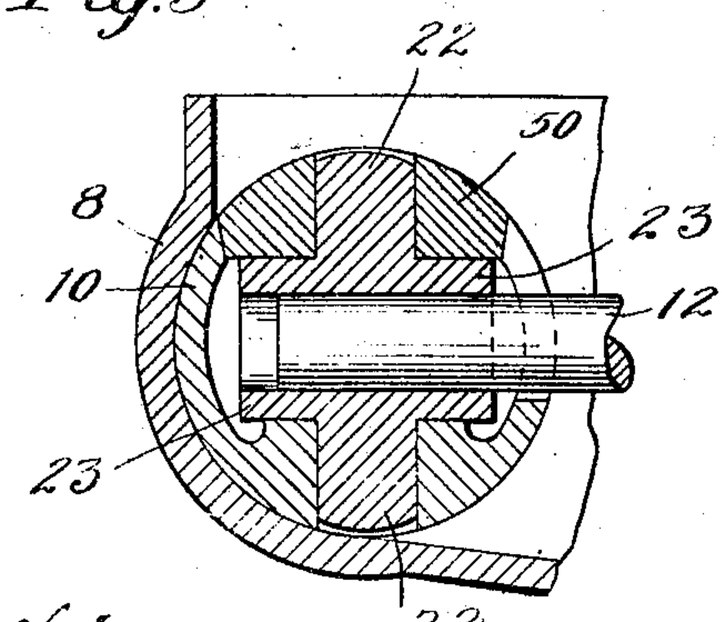
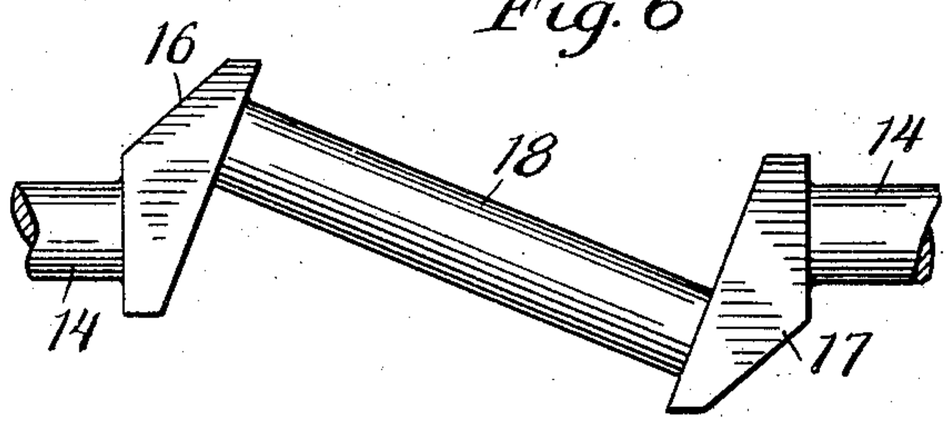


Fig. 6



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UNITED STATES PATENT OFFICE.

LUDWIG PETTERSON, OF CHICAGO, ILLINOIS.

GASOLENE-MOTOR.

No. 820,010. Specification of Letters Patent. Patented May 8, 1906.

Application filed June 6, 1904. Serial No. 211,233.

To all whom it may concern:

Be it known that I, LUDWIG PETTERSON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Gasolene-Motors, of which the following is a specification.

This invention relates to the construction of gasolene-engines adapted to be used upon automobiles. Its object has been to improve upon previous constructions; and it consists in the novel construction of parts and devices and novel combinations of parts and devices hereinafter described.

In the accompanying drawings, Figure 1 is a plan view of my invention, partly in section. Figs. 2 and 3 are sections on the lines 2 2 and 3 3, respectively, of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 2. Fig. 5 is a detail section of the joint between the crank and one of the pistons. Fig. 6 is a detail view of the crank, and Fig. 7 is a section on the line 7 7 of Fig. 4.

In said drawings, 7 and 8 are two companion two-cycle cylinders arranged in parallel positions and provided with pistons 9 and 10, which are connected directly to a peculiar crank embodied in the driven shaft 14, which is arranged between the cylinders and parallel thereto. The connection to the crank is through the medium of two arms 11 and 12, loosely supported upon the crank, as hereinafter more fully explained, and in order to permit this connection the proximate sides of the cylinders are cut away, as seen at 15, to give the necessary access to the pistons.

The crank which is shown detached at Fig. 6 consists of two oppositely-extending inclined cranks or arms 16 and 17, attached to the shaft and a round bar or body 18, connecting the outer ends of the arms and extending diagonally across the axis of the shaft. The arms 11 and 12 are formed on the opposite sides of a plate 19, located above the body 18 and secured thereto by a plate or cap 20, located below the body, and bolts 21, passing through both plates. The body 18 is free to turn between the plates, which are shaped to and loosely inclose it.

The arms 11 and 12 are flexibly joined to the pistons by the following construction: The outer ends of the arms are cylindrical and inserted in boxes having upper and lower vertical pivots 22, fitting corresponding openings in the pistons, so that the boxes may swivel or rock in horizontal directions. (See Fig. 5.) The boxes have also laterally-extending hollow arms 23, giving a wide bearing to the arms 11 and 12 and in which the latter are free both to slide and to turn. With this construction it will be seen that each piston when it receives an impulse from the explosion of a charge of gasolene is urged in a direction parallel to the shaft and carries with it the arm 11 or 12, by which it is connected to the crank, and such movement is by reason of the angling position of the body of the crank adapted to give the latter a rotary movement, the plate 19 rocking freely so as to accommodate itself to the movements of the crank. As the pistons are operated simultaneously in opposite directions the crank and shaft are by the means described continuously rotated, each pair of simultaneous explosions operating the crank through a half-rotation. A fly-wheel 24 is desirably mounted on the shaft 14. The plates 19 and 20 are confined on the crank-body by the cranks 16 and 17.

The explosion-chambers of the cylinders are shown at 25, and such chambers are provided with surrounding cooling water-chambers 30, and the screw-plugs 31 and 32 in the ends of the cylinder and the water-chamber close the core-openings in the castings. The igniters 34 enter the chambers through the openings 33. The air and gasolene are admitted by the passages 40 and exhaust by the ports 35. The other or non-power creating ends of the cylinders are closed by suitable heads 36, forming air-chambers 26, and each is utilized as a cushion to the piston and as a means for forcing the charges of air and gasolene into the explosion-chamber of the other cylinder through a suitable cross-passage between it and the explosion-chamber. This passage is illustrated at Fig. 4 and is indicated at 40. It is provided with two automatic or spring closing valves, the one at 41 permitting the entrance of the outer air and gasolene to the passage from the inlet 43 and the other at 42 closing the passage 40 itself. When the pistons move into the explosion-chambers and compress the charges of air and gasolene therein preparatory to ignition, they create a vacuum in each of the chambers 26, which causes suction and the opening of valves 41, admitting fresh charges of air and gasolene to said chambers, and when the explosions occur and the pistons begin their return movement the valves 41 close, so that fresh charges of air and gasolene are

compressed, and consequently as soon as the return movement of the pistons has partially uncovered the exhaust-passages 35, so as to remove the pressure in the explosion-chambers, the compressed fresh charges will open valve 42 and rush into and fill the explosion-chambers, driving out in so doing the exhaust or spent gases then remaining therein. In this manner I insure the presence in the explosion-chambers of fresh air in the necessary quantity for efficient work and the absence therefrom of the dead or spent air and gases.

The top of the pistons are left open over the boxes 22 23 in order to admit the latter, and after the boxes have been positioned retaining rings or caps 50, inclosing the upper pivots 22 of the boxes, are bolted to the pistons. The two cylinders are desirably each provided with a lateral arm 51, forming the under part of one of the bearings of the shaft 14. Each cylinder also has a lateral extension 52, forming a junction with arm 51, as seen at Fig. 4, and bolted thereto. The air-passage 40 is formed partly in arm 51 and partly in the extension 52. A covering-plate 55 is preferably placed over the crank, as seen at Fig. 1.

It will be understood that the construction and arrangement illustrated in the drawings and herein specifically described embody my invention in its preferred form only and that my claims are not strictly limited thereto, but may be otherwise embodied without departing from the spirit thereof.

I claim—

1. The combination of companion simultaneously-exploding cylinders, each having an explosion-chamber at one side of the piston and an air-compression chamber at the other side thereof, the explosion-chamber of each cylinder being connected by a valved passage to the air-compression chamber of the other cylinder.

2. The combination of companion simultaneously-exploding cylinders each having an explosion-chamber at one side of the piston and air-compression chamber at the other side thereof, cross-passages connecting the explosion-chamber of each cylinder with the air-compression chamber of the other cylinder, and valves in said passages regulating the entrance of fresh air to the air-compression chambers and permitting the forcing of the air from the air-compression chambers to the explosion-chambers.

3. The combination of companion simultaneously-exploding cylinders each having an explosion-chamber at one side of the piston and air-compression chamber at the other side thereof, cross-passages connecting the explosion-chamber of each cylinder with the air-compression chamber of the other cylinder, and automatic valves 41 and 42 controlling such passages.

4. A two-cycle gasolene-engine having companion simultaneously-exploding cylinders, each embodying an explosion-chamber and a compression-chamber, the compression-chamber of one cylinder supplying the explosion-chamber of the other with air and gasolene, and pistons in said cylinders whereby the air and gasolene are simultaneously compressed and forced into the explosion-chambers.

5. A double two-cycle engine embodying cylinders which explode simultaneously and which simultaneously compress air charges, the compression-chamber of each cylinder being connected with the explosion-chamber of the other cylinder.

6. A double two-cycle engine, one end of each cylinder of which is utilized to compress the air charges of the other cylinder, the cylinders being exploded simultaneously and acting simultaneously to compress the air charges.

LUDWIG PETTERSON.

Witnesses:
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