

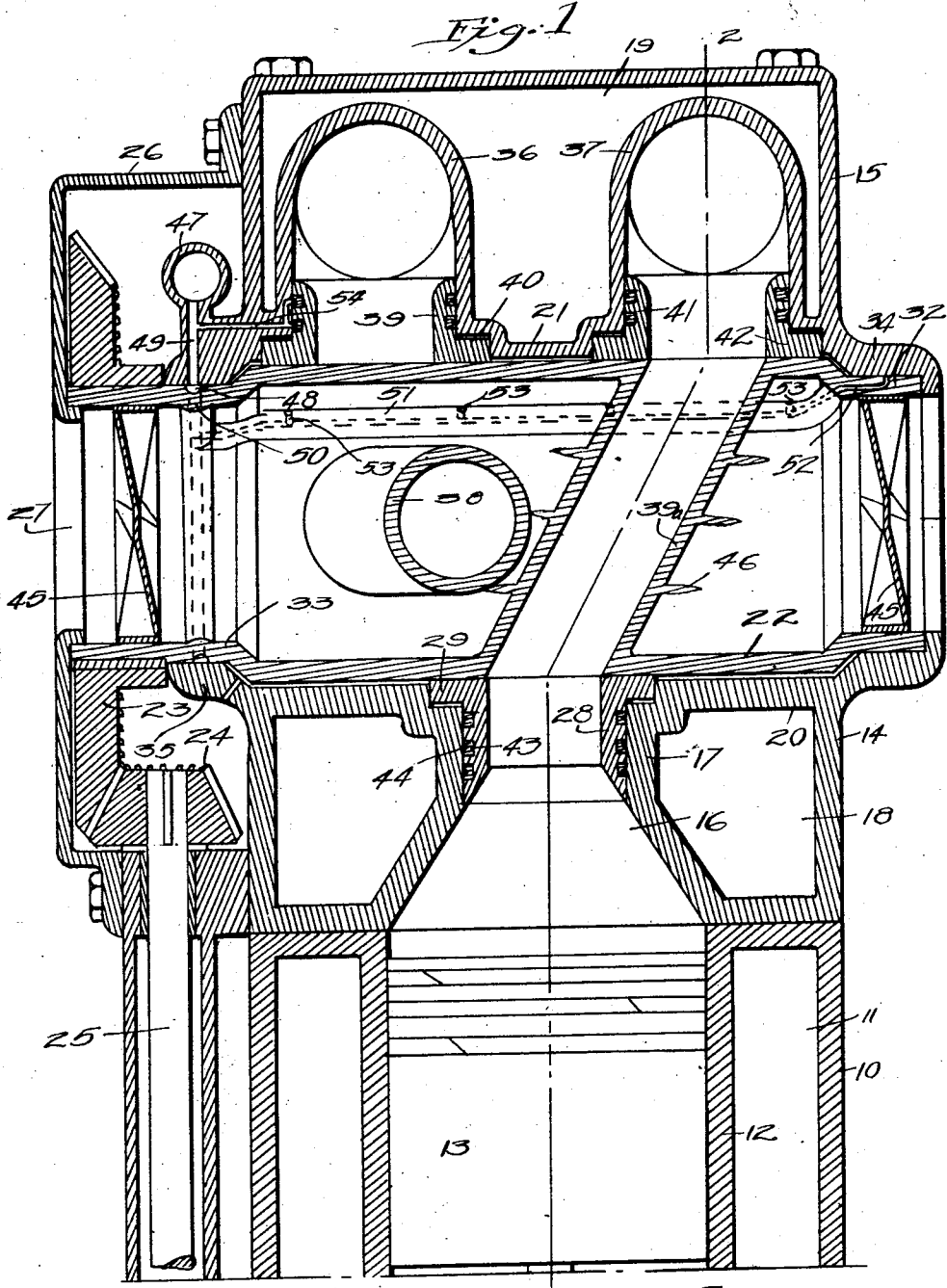
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ENGINE AND VALVE STRUCTURE

Filed May 15, 1922

2 Sheets-Sheet 1



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Lynn Latta

Inventor
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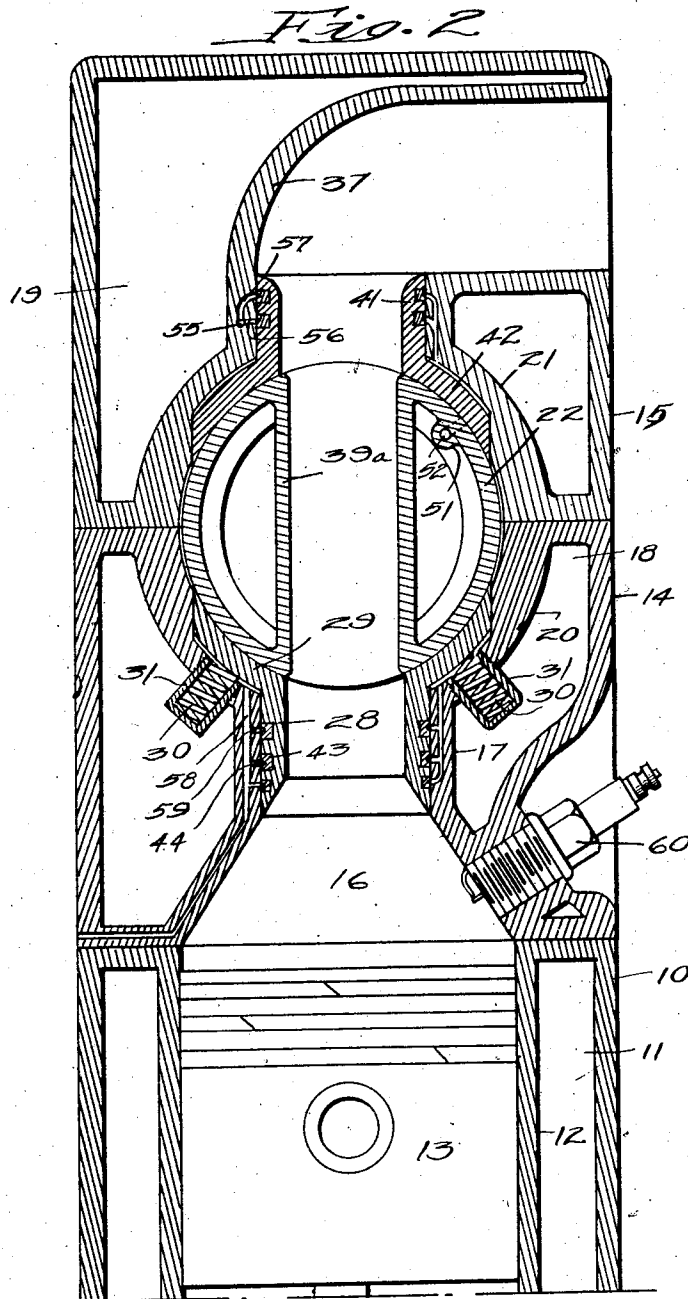
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UNITED STATES PATENT OFFICE.

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ENGINE AND VALVE STRUCTURE.

Application filed May 15, 1922. Serial No. 561,153.

The object of my invention is to provide an engine and valve structure of simple, durable and inexpensive construction.

More particularly, it is my object to provide the combination of an engine structure with a rotary valve of the general type set forth in my application, Serial No. 515,548, filed November 16, 1921, the present application showing certain modifications and improvements.

A further object is to provide in such a structure a suitable oiling system of novel construction.

Still a further object is to provide a device, having a cylinder or cylinders with a rotary valve mounted above the cylinders and to provide a cylinder having a combustion chamber with a dome-shaped portion.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my 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, central, sectional view through a device embodying my invention; and

Figure 2 shows a transverse, vertical, sectional view taken on the line 2—2 of Figure 1.

In the accompanying drawings, I have used the reference numeral 10 to indicate generally the engine block, having the water jacket 11 and the cylinder 12.

Mounted in the cylinder 12 is an ordinary piston 13. Above the body of the block 10 is the engine head 14, above which is the cap or the like 15.

Formed in the engine head 14 above the cylinder 12 is a dome-shaped chamber 16 arranged in direct communication with the cylinder and having at its upper end an upward cylindrical extension 17.

The engine head 14 has the water jacket 18 and the cap 15 has the water jacket 19. The engine head 14 and cap 15 have bearing portions 20 and 21 formed adjacent to each other to receive the hollow rotary valve or sleeve 22. The sleeve 22 has mounted on one end a bevelled gear 23, which meshes with a

bevelled gear 24 on a suitable driving shaft 25.

At the front end of the engine, the gears are covered by a casing cap 26, which has an opening 27 arranged to register with the opening in the valve 22.

The valve 22 is preferably received between what I may for convenience call adjustable bearing shoes. Slidably mounted in each cylindrical extension 14 at the top of the dome-shaped combustion chamber portion 16 is a tubular sleeve 28. It may be here mentioned that while I have in my drawings shown only one cylinder, my device is intended to be embodied in multiple cylinder engines.

At the upper end of the ordinary sleeve 28 is formed the adjustable bearing shoe 29 upon which the valve 22 is supported. The bearing shoes 29 are intended to be vertically adjustable to a limited extent for the expansion and contraction of the rotary valve 22 and are yieldably held in snug supporting position for the valve 22 by springs.

In the particular form of my invention illustrated in the accompanying drawings, I have shown the springs 30 received in casings 31 screwed into the member 20, as shown for instance in Figure 2.

The ends of the rotary valve or sleeve 22 are slightly reduced, as at 32 and 33, and these ends are mounted in suitable bearings 34 and 35, which may be of any well-known type adapted to serve the purpose.

Above the valve 22 are the intake and exhaust pipes 36 and 37. On the interior of the sleeve 22 are diagonally arranged intake and exhaust passages 38 and 39, spaced from each other around the valve 22 at the proper distances for efficient timing and engine operation.

The intake pipe 36 communicates with the intake passage 38 of the valve 22 through a sleeve 39 similar in general construction to the sleeve 28, having at its lower end a bearing shoe 40, similar to the bearing shoe 29.

It will, of course, be understood that at one point in the rotation of the bearing 21, the passage 38 registers with the sleeve 39 and the sleeve 28.

The exhaust pipe 37 communicates with

the valve 22 through a sleeve 41 similar to the sleeves 28 and 39. At the lower inner end of the sleeve 41 is a bearing shoe 42 similar to the bearing shoes 29 and 40.

It will be understood that at the proper point in the rotation of the valve 22, the exhaust passage 39^a registers with the sleeve 28 and the sleeve 41.

In this connection, it should be mentioned that while I have shown the sleeves 28, 39 and 41 and the passages 38 and 39^a round, they may be elliptical in cross section or of any suitable shape to accomplish the purpose.

The sleeves 28, 39 and 41 are provided with ring grooves, which receive rings 43 similar to ordinary spring piston rings. These rings have in their outer surfaces oil grooves 44.

Mounted in the reduced portions 32 and 33 of the rotary valve 22 are suitable fans or propellers 45 for facilitating the rapidity of movement of air through the rotary valve or sleeve 22.

The exhaust passage 39^a may be provided with annular flanges 46 to facilitate the cooling of the exhaust passage for the radiation of heat therefrom.

I provide an oil supply pipe 47 through which oil may be pumped to the upper part of the device. The reduced portion 33 of the valve 22 is provided with an annular, external oil groove 48. A passage 49 leads from the oil supply pipe 47 through the groove 48, and it will be thus seen that oil will be supplied through the bearing 35.

A hole 50 leads from the groove 48 to the interior of the reduced portion 33. Communicating with the hole 50 is a tube 51, which is extended to the opposite end of the valve 22 and is curved around the passages 38 and 39^a and communicates with an oil passage 52 leading to the exterior of the reduced portion 32, and oil is thus supplied to the bearing 34.

The tube 51 communicates with holes 53 leading to the exterior of the valve 22 for supplying oil to the shoes 40, 42 and 29.

A passage 54 leads from the passage 49 for supplying oil to the sleeve 39. A passage 55 leads from the passage 54 alongside the upper part of the bearing member 21. Small passages 56 and 57 are adapted to supply oil from the passage 55 to the sleeves 39 and 41.

The oil discharged through the tube 53 will be carried around by the valve 22 and will work under the shoe 29 and pass through the passages 58 and 59, as shown in Figure 2, to the sleeve 28.

It will thus be seen that oil is supplied through the bearing 33 through the pipe or tube 47, the passage 49 and the groove 48. Oil is supplied to the bearing 34 through the passage 49, the opening 50, the

tube 51 and the passage 52. Oil is delivered to the sleeves 39, and 41 through the passages 49, 54, 55 and 56. Oil discharged through the tube 53 will lubricate the bearing shoes 40 and 42 and will be carried around by the rotary valve for lubricating the bearing shoe 29, and will then pass under said bearing shoe and through the passages 58 and 59 to the sleeve 28.

The spark plug 60 is preferably mounted in the wall of the dome-shaped portion 16 of the combustion chamber.

It will be seen from the foregoing that I have provided with my improved rotary valve of the type in which the bearings are adjustable, to always properly snugly support the valve, and an oiling system by which all the working parts are thoroughly oiled.

It may be well to mention in this connection that the sleeves 28 and 39 and 41 have comparatively little motion, so that no great amount of friction is developed between them and the parts in which they are mounted.

By providing the dome-shaped portion 16 of the combustion chamber, I have made what I believe to be a more efficient chamber than any other. With a combustion chamber of this shape, no pockets are left in which dead gases can remain, and the combustion chamber is more thoroughly scavenged, than would be otherwise possible.

It will also be noted that the movement of the gases will tend to keep the points of the spark plug 60 clean.

I have also used the propellers or fan devices 45 for increasing the movement of air through the rotary valve 22 for thus facilitating the cooling of that valve.

The provision of the flanges 46 will help in the cooling of the exhaust passage 39^a.

I do not desire to be considered as having limited myself to the use of this structure with internal combustion engines, since it may be used with steam and other engines.

While some changes may be made in the construction and arrangement of the parts of my improved structure, it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a device of the class described, an engine block having a cylinder, a piston in the cylinder, a tubular neck at the intake end of the cylinder, a head above the cylinder, having a tubular valve casing formed therein, a rotary valve in said casing, intake and exhaust passages adjacent to the valve having tubular necks, bearing shoes fitted into said casing having tubular extensions slidably received in said necks, spring casings detachably and adjustably mounted in the wall of

said valve casing adjacent to the lower shoe on opposite sides of the tubular extension thereof, and springs in said spring casings for yieldingly pressing the shoe against the
5 valve.

2. In a device of the class described, an engine block having a cylinder, a piston in the cylinder, a tubular neck at the intake end of the cylinder, a head above the cylinder, having a tubular valve casing formed therein, a rotary valve in said casing, intake and exhaust passages adjacent to the valve having tubular necks, bearing shoes fitted into said casing having tubular extensions slidably
10 received in said necks, spring casings detachably and adjustably mounted in the wall of said valve casing adjacent to the lower shoe on opposite sides of the tubular extension thereof, and springs in said spring casings
15 for yieldingly pressing the shoe against the

valve, said head being formed in two parts connected approximately at the horizontal middle of the valve to allow ready access to the valve springs and spring casings.

3. In a device of the class described, an engine block, having a cylinder, a piston in the cylinder, a tubular neck at the intake end of the cylinder, a head above the cylinder, having a tubular valve casing formed therein, a rotary valve in said casing, a bearing shoe
25 fitted into said casing having a tubular extension slidably received in said neck, spring casings detachably and adjustably mounted in the wall of said valve casing adjacent to said shoe on opposite sides of its tubular extension, and springs in said spring casings
30 for yieldingly pressing the shoes against the valve.

PEARL G. FRAZIER.