E. A. RIOTTE.

VALVE FOR COMBUSTION ENGINES.

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Fig. 1

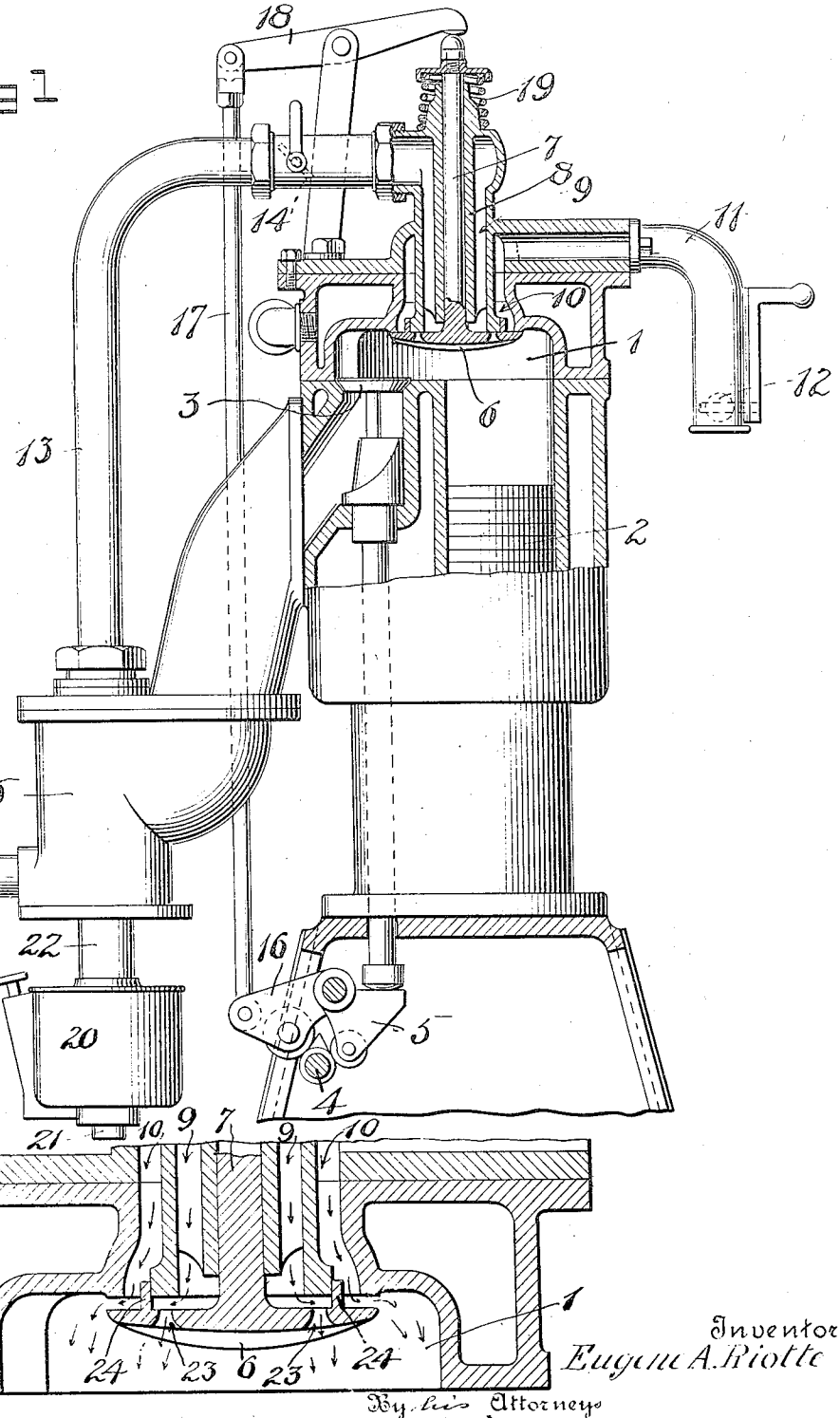


Fig. 2

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VALVE FOR COMBUSTION-ENGINES.

1,245,511. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed February 3, 1917. Serial No. 146,347.

To all whom it may concern:

Be it known that I, EUGENE A. RIOTTE, a citizen of the United States of America, residing at Douglaston, Long Island, New York, have invented a new and useful Valve for Combustion-Engines, of which the following is a specification.

My invention relates to internal combustion engines, the object being to provide means whereby the heavier hydro-carbons, for example, kerosene, may be effectively employed for fuel.

In many respects my present invention embraces the means disclosed in my copending application Serial No. 136,941, filed Dec. 14, 1916, but the present invention aims at simplifying the construction set forth therein by reducing in number certain of the operative parts.

It will be seen from an examination of the accompanying drawings, and a reading of the following specification, that the improvement relates particularly to the construction and operation of the intake valve means. Whereas in my former case, above referred to, I employed two intake valves for the purpose of admitting fuel and air, in the present case I accomplish the same result with a single valve.

In the drawings:

Figure 1 is a side elevation partly in section of an engine constructed to embody my present improvement.

Fig. 2 is a relatively enlarged detail view in section of certain parts.

1 represents the head of an engine cylinder provided with the usual piston 2 connected in the usual way with a crank shaft not shown. 3 is an exhaust valve operated by suitable means such as a cam shaft 4, there being in this event an intermediate cam actuated rocker 5 between said cam and the lower end of the stem of the valve 3. 6 is the admission valve. 7 is the stem of said valve which slides through a sleeve 8. Surrounding the sleeve 8 is an annular gas passage 9 which opens into the cylinder through the head 1 but which is controlled by the valve 6. 10 is an annular air admission passage around the wall of the gas admission passage 9. This annular air admission passage 10 opens into the cylinder and is likewise controlled by the valve 6. Air is admitted to the passage 10 through a supply pipe 11, which may have a controlling valve 12 therein. Gas is admitted to the passage 9 through the pipe 13 which may have a controlling valve 14 therein. 15 conventionally represents a gas generating chamber wherein gas is formed and which gas is drawn into the engine on the suction stroke through the pipe 13 and passage 9, the valve 6 at that time being open. The valve 6 is preferably mechanically operated in any suitable manner as from the cam shaft 4. 16 is a rocker arm connected to a rod 17 in turn connected to a rocker arm 18 which engages the upper end of the valve stem 7. The operation of said rocker arm 18 is so timed that the valve 6 will be positively opened at the proper moment to admit the ingredients which form the combustible mixture in the cylinder. 19 is a spring for closing the valve 6. By preference, the gas which is formed in the generator 15 is heated by the exhaust from the engine, so that the gas flowing through the passages 13 and 9 will be in a relatively hot state when delivered to the engine cylinder, thereby preventing condensation *en route*. Since the gas generated is likewise too rich to burn properly, said gas is adulterated within the cylinder by the air admitted through the annular passage 10. 20 conventionally represents the float chamber of the generating apparatus in which chamber fuel, for example, kerosene, is maintained at the appropriate level and is drawn off in an atomized state by air which rushes in through the pipe 21 so that the atomized fuel will pass up through pipe 22 into the hot portion 15 of the generator, where it is converted into the relatively hot rich gas which is fed into the cylinder.

Now referring to Fig. 2 and more particularly to the construction of valve 6. As shown, this valve is of sufficient area to cover the open ends of the passages 9 and 10. The valve is provided with gas passages 23—23 located between the stem 7 and the outer edge of the valve, which passages lie directly under the lower edge of the wall between the passages 9 and 10, so that when the valve 6 is closed, the passages 23 will be closed. 24 is an annular wall or barrier on the upper side of the valve 6, the function of which is to prevent the gas, as it is flowing toward the cylinder from mixing with the air that is simultaneously flowing into said cylinder. That is to say, the gas en-

tering through the passage 9 flows into the central part of the cylinder through the passages 23—23 while the air will flow into the cylinder around the outer edge of the valve, thereby forming an air envelop between the central core of relatively rich gas and the wall of the cylinder so as to function after the manner set forth in my former application above referred to. It will be understood, of course, that by the term "air" I mean to include pure air or any gas that will properly adulterate the relatively rich gas so as to form in the cylinder a proper combustible mixture which may be ignited at the proper time by any suitable means. The annular wall or barrier 24 on the valve 6 is preferably located just outside of the annular wall separating the inlet passages 9—10, but it need not necessarily make a tight fit. Indeed, it will be preferable to have a free sliding fit so that there will be no danger of interference with the functioning of the valve itself.

It will be seen that the gas and air simultaneously flow directly into the cylinder so that there will be no danger of impingement of the gas on the cylinder walls. The valve, as is my former case, is preferably located concentrically with the bore of the cylinder, although this position may be altered in some cases.

I have shown my invention as applied to an engine of the four-cycle variety, but it should be understood that it is entirely possible that the same may be adaptable to an engine of the two-cycle variety. I may refer in the claims to the passages 9 and 10 through which gas and air are respectively admitted to the cylinder as ports.

I claim:

1. In an internal combustion engine, a cylinder having a gas admission port opening directly thereinto and a second port adjacent said gas admission port opening directly into the cylinder independently of the first port for admitting an adulterant for the gas directly into the cylinder, a single valve covering both of said independent admission ports and thereby controlling direct admission of both the gas and the adulterant into the cylinder and means for maintaining the in-flowing gas and adulterant separated when the valve is opened and the charge is flowing into the cylinder.

2. In an internal combustion engine, a cylinder, an exhaust passage, two concentrically located inlet ports opening directly into said cylinder and being separate from each other, a single valve having a central stem and positively actuated to open and close both ports, said valve having a passage to permit fluid from the inside port to pass through said valve when the latter is open, whereby the separate gases are simultaneously injected directly within said cylinder.

3. In an internal combustion engine, a cylinder, an exhaust passage, two concentrically located inlet ports opening directly into said cylinder and being separate from each other, a single valve positively operated to open and close both ports, said valve having a passage to permit fluid from the inside port to pass through said valve when the latter is open, and a barrier to prevent said fluid from mixing with the fluid entering through the outside port until both fluids have directly entered the cylinder.

4. In an internal combustion engine, a cylinder, two concentric inlet ports divided by a wall and opening directly into said cylinder and being independent of each other, a single valve operating to positively open and close both of said ports, a passage through said valve arranged to be closed by said wall when the valve is closed.

5. In an internal combustion engine, a cylinder, two concentric inlet ports divided by a wall and opening directly into said cylinder and being independent of each other, a single valve operating to open and close both of said ports, a passage through said valve arranged to be closed by said wall when the valve is closed, a barrier carried by said valve between the passage therethrough and the outer edge thereof to prevent the mixing of the fluids conducted by said ports respectively until said fluids have directly entered the cylinder.

6. In an internal combustion engine, a cylinder, two concentric inlet ports leading directly into said cylinder and being independent of each other and a single valve for opening and closing both of said ports at substantially the same time, a passage through said valve open when said valve is open to permit fluid to pass from the inside port through the valve and into the cylinder without mixing with the fluid entering the cylinder through the outside port until both fluids have passed the valve and are within said cylinder.

7. In an internal combustion engine for heavy hydrocarbons, a cylinder having two annular concentric inlet ports arranged one within the other and each having a passage leading directly into the cylinder independently of the other, a single mushroom valve covering both said ports at their entrances to the cylinder and means for positively actuating said valve.

EUGENE A. RIOTTE.