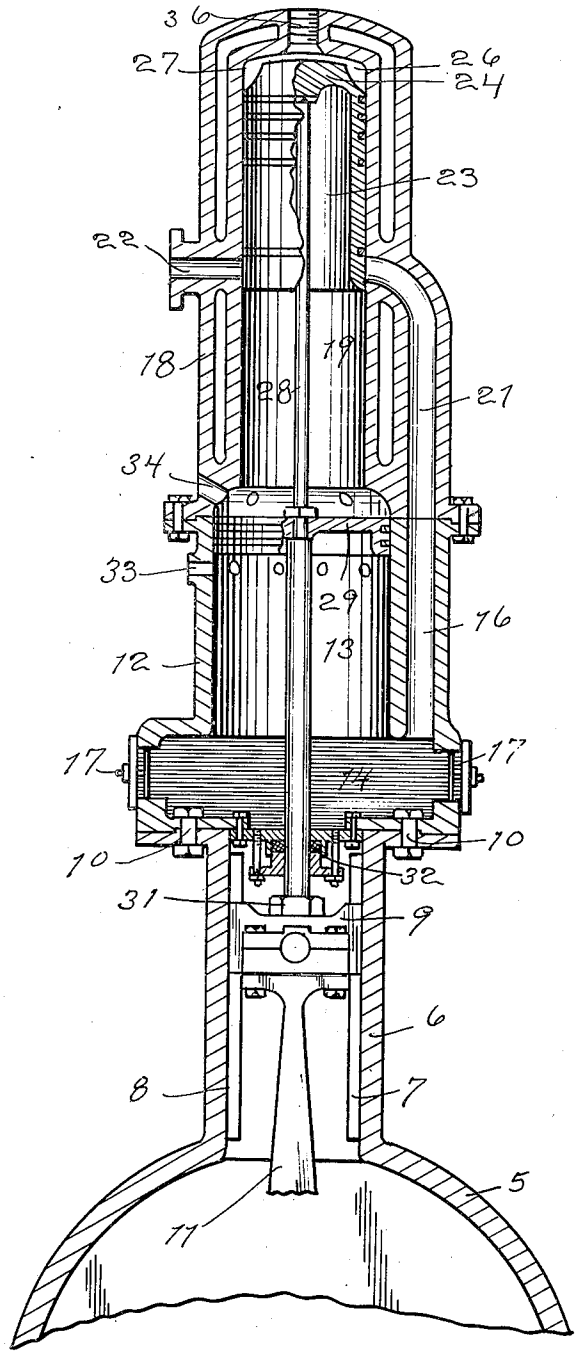
Aug. 4, 1925. 1,548,705

E. T. BLAKE

TWO-CYCLE OIL ENGINE

Filed Dec. 22, 1924



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UNITED STATES PATENT OFFICE.

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TWO-CYCLE OIL ENGINE.

Application filed December 22, 1924. Serial No. 757,490.

To all whom it may concern:

Be it known that I, EDWIN T. BLAKE, a citizen of the United States, residing at Kennsington Precinct, in the county of Contra Costa and State of California, have invented new and useful Improvements in Two-Cycle Oil Engines, of which the following is a specification.

This invention relates to improvements in two cycle oil engines.

The principal object of this invention is to produce a two cycle engine which has the efficiency of a four-cycle engine. It is a well-known fact that a four-cycle engine is more efficient than a two-cycle engine, but lacks the simplicity of a two-cycle engine.

Another object of this invention is to produce a two-cycle engine which will have a more perfect scavenging action.

An additional object of this invention is to produce an engine which will be simple in construction, and, therefore, cheap to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same—

The figure is a vertical cross section partly in elevation showing an engine constructed in accordance with my invention.

In a two-cycle engine it has been difficult to secure perfect scavenging, because of the fact that the underside area of the piston was less than the top area by an amount equal to the cross section of the piston rod, with a result that the air or gas compressed below the piston would not be sufficient to completely fill the explosive chamber with a result that some of the burned gas would remain in the cylinder and, therefore, lower the efficiency of the engine. I have overcome this difficulty by providing a second piston of greater diameter than the first piston and thereby compressing a larger volume of air than is needed for the explosive cylinder, with a result that the burned gases are forced out of the cylinder and fresh air of a low pressure is forced into the cylinder.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates the crank-shaft housing, the numeral 6 a support, upon which slideways 7 and 8 are position and upon which slideways the cross head 9 travels. This cross head is connected to the crank shaft by the customary connecting rod 11.

At 12 I have shown a casting secured to the support 6 as by bolts 10 and bored to form a cylinder 13 and provided with a chamber 14 This casting also has a passage 16 formed therein which communicates with the chamber 14 and at 17 I have shown valves adapted to admit air to this chamber.

At 18 I have shown a casting super-imposed upon the casting 12, which casting has a bore 19 in axial alignment with the bore 13 of the casting 12. This casting also has a passage 21 which is adapted to align with the passage 16 of the casting 12.

This passage 21 communicates with the bore 19. An exhaust port 22 is positioned in the casting 18 at a point substantially diametrically opposite the passage 21, the purpose of which will be later seen. At 23 I have shown a piston having the customary rings and a head 24 chamfered as at 26 and 27, the purpose of which will be later seen. This piston travels within the bore 19 and is connected to a piston rod 28, which piston rod also has secured thereto a piston 29, which is adapted to reciprocate in the bore 13.

This piston rod 28 is further connected by a nut 31 to the cross head 9 and passes through a stuffing box 32, the construction of which is well-known, and needs no further comment. At 33 I have shown inlet ports adapted to further assist in permitting air to enter below the piston 29, while at 34 I have shown breather openings which permit air to enter beneath the piston 23.

Due to the differences in the size of the pistons 23 and 29, each reciprocation will cause the circulation of air to enter the breathers 34 and, therefore, assist in cooling the interior of the engine.

The manner of operating my device is as follows:—

A fuel supply pipe is connected to a suitable ignition valve and nozzle which is threadedly engaged with the opening 36. The engine is then given a revolution, with a result that air is further compressed beneath the piston 29 and expelled through the passages 16 and 21, the result being that as soon as the piston 23 reaches a point low enough to uncover the outlet of the passage

21 and the exhaust port 22, the compressed air in the passage will enter the cylinder, strike against the chamfered head and will be directed upwardly, with a result that any burned gases which might be in the cylinder will be quickly expelled through the exhaust port.

On the next upward stroke, the air in the cylinder will be compressed, the shot of fuel will be sprayed into the cylinder and a spark will be caused to explode the mixture. During the upward movement, the partial vacuum formed between the piston 29 will cause air to be drawn in through the valves 17 and also the ports 33. The further operation of the motor will merely be a continuation of the cycle just described.

It will thus be seen that I have provided a motor which will accomplish all of the objects above set forth and one which will be efficient in operation.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:—

In an internal combustion engine, a casting having a bore therein, a piston positioned in said bore, a second bore in parallel alignment with said first mentioned bore, said bores being in communication with each other, a piston positioned in said second mentioned bore, said second mentioned bore being of a lesser diameter than said first mentioned bore, a rod extending between said pistons, said first mentioned piston being adapted to compress a fluid therebeneath, a cross head connected to said pistons, means connecting said cross head to a crank shaft, a passageway formed adjacent said bores, one end of said passageway communicating with said first mentioned bore at a point below the piston therein, the other end of said passageway communicating with said second mentioned bore at a point substantially mid-way of its length, and means for admitting a compressible fluid into said first mentioned bore, for the purpose specified.

In testimony whereof I affix my signature.

EDWIN T. BLAKE.