C. W. JACKSON.

COMBINED AIR AND OIL VALVE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED FEB. 27, 1913.

1,068,056.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

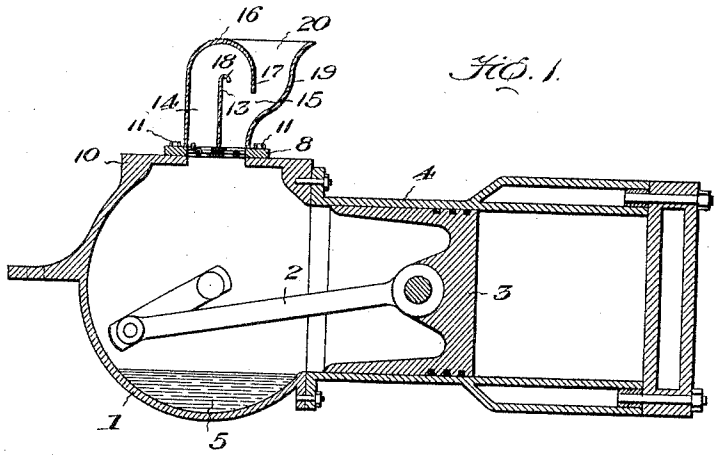


Fig. 1.

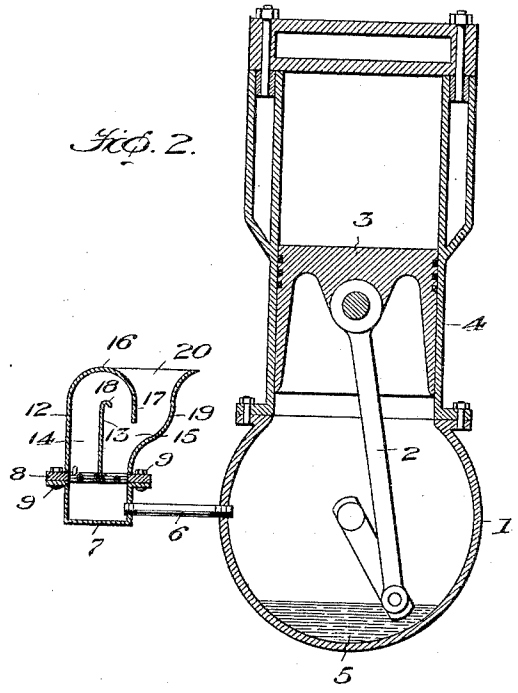


Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

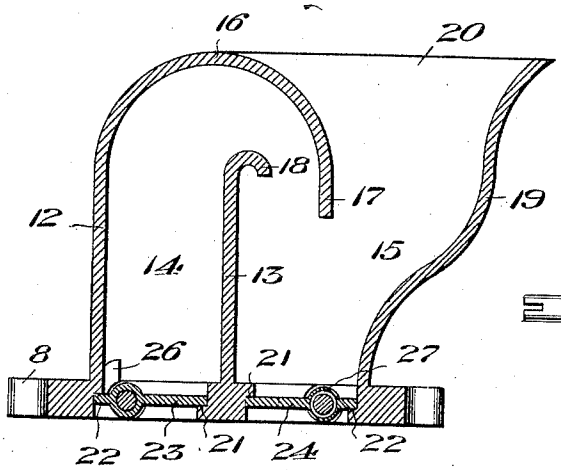


Fig. 6.

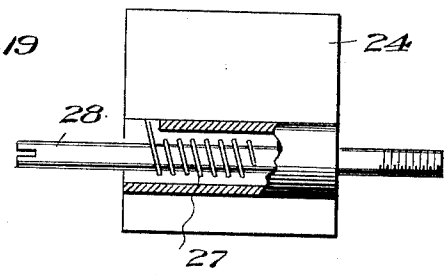


Fig. 4.

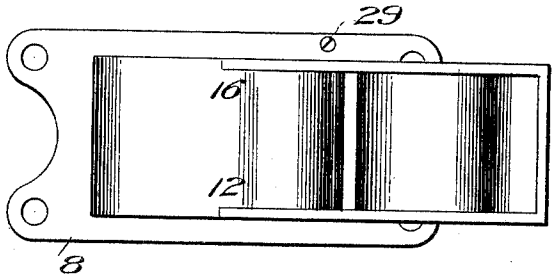
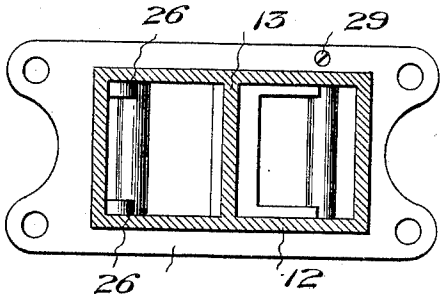


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

CLARENCE WHITTINGTON JACKSON, OF DUNKIRK, MONTANA, ASSIGNOR OF ONE-HALF TO NELS P. HANSON, OF DUNKIRK, MONTANA.

COMBINED AIR AND OIL VALVE FOR INTERNAL-COMBUSTION ENGINES.

1,068,056. Specification of Letters Patent. Patented July 22, 1913.

Application filed February 27, 1913. Serial No. 751,034.

To all whom it may concern:

Be it known that I, CLARENCE W. JACKSON, a citizen of the United States, residing at Dunkirk, State of Montana, have invented certain new and useful Improvements in Combined Air and Oil Valves for Internal-Combustion Engines, of which the following is a specification.

This invention relates to a combined air and oil valve for internal combustion engines.

In internal combustion engines having crank case lubrication, particularly those of the four-cycle type, the oil in the crank case is thrown about and tends to escape in the form of an oil-mist, there being air pressure in the crank case on account of the operation of the engine. To relieve this air pressure means should be provided for its escape from the crank case, but with the air there also escapes the lubricating oil.

The present invention has for its object the provision of a combined air and oil valve which can be applied to the crank case of either a two or four-cycle internal combustion engine, whether of the horizontal or vertical type, whereby the air pressure in the crank case will be relieved, air supplied to the crank case, and the lubricating, more or less atomized oil, escaping with the compressed air, will be automatically returned to the crank case on a succeeding suction or intake of air, thereby affording means for saving the oil and using it over and over again without danger of its discharge from the engine and at the same time affording means for the intake and exhaust or relief of air.

The embodiment of the invention set forth hereinafter and shown in the accompanying drawings is a preferred form, but is to be deemed as illustrative, rather than restrictive, of the scope of the invention.

In the accompanying drawings: Figure 1 is a longitudinal section through a horizontal internal combustion engine, with my invention applied thereto, which is shown in section; Fig. 2, a view showing the invention applied to a vertical engine; Fig. 3, an enlarged detail longitudinal section of the invention; Fig. 4, a plan view thereof; Fig. 5, a horizontal section; and Fig. 6, a detail of the spring-actuated valve.

In Fig. 1 there is shown a horizontal engine and in Fig. 2, a vertical engine. Each engine shown has a crank case 1, crank 2, piston 3 and cylinder 4, the lubricating oil in the crank case appearing at 5.

In those types of horizontal engines which have a flat top, the invention may be applied to such flat top as shown in Fig. 1, but if the engine has no such top, the invention may take the form shown in Fig. 2, which adapts it for application to any horizontal or vertical engine. In that form, in addition to the valve construction and case hereinafter described, there is a pipe section 6 adapted to be attached to the crank case and leading to a box or chest 7 to which the base 8 of the valve is connected in any suitable manner by fastenings 9.

Where the engine has a flat top to its crank case, as shown in Fig. 1, at 10, the base 8 is directly fastened thereto by fastenings or bolts 11. Preferably, cast or formed integral with the base, is a casing 12 which has a central partition 13 dividing it into chambers or compartments 14 and 15. The top of the casing is curved at 16 and extends down at 17 in reëntrant manner into the casing to a point below the upper end of the partition 13, the latter having a flange 18. The remaining wall 19 of the casing 12 is open to the atmosphere at 20 and is preferably formed on a compound curve so as to more readily admit the air to be drawn into the crank case and to void the air therefrom.

The base 8 is provided with valve seats 21 and 22 and there are provided an air and oil outlet valve 23 and an air and oil inlet valve 24. The valves are of substantially the same form, but open in opposite directions, the valve 23 opening outwardly and the valve 24 opening inwardly in relation to the crank shaft. Valve 23 may be spring closed, but is preferably simply pivoted at 25 and closes by gravity, being prevented from assuming an exact vertical position by stops 26. Valve 24 is preferably spring closed, a convenient adjustable spring means for this purpose being shown at 27, the tension of the spring being regulated by the pivot 28 and the set screw 29.

The present invention admits and voids air to and from the crank case as the piston moves forward and returns without any resultant loss of the lubricant 5. When the piston goes forward, the oil is forced past the valve 23 and when the piston returns,

the valve 23 closes and air is sucked down through 20 and 19 and past valve 24 into the crank case, drawing with it the oil which has previously been forced past valve 23. The curved form of the casing or shell top 16 causes the oil to be thrown down on the valve 24 so that when that valve is opened downwardly or inwardly by the suction of the piston 3, the air and the oil deposited on the valve pass into the crank case.

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

1. The combination with the crank case of an internal combustion engine, of a combined air and oil valve therefor adapted to relieve the air pressure in the crank case and to admit thereto the discharged lubricant and air.

2. The combination with a crank case of an internal combustion engine, of a shell or casing having communicating compartments and an air opening, an admission valve adapted to admit air and lubricant from one compartment of the casing to the crank case, and an outlet valve adapted to admit air and lubricant discharged from the crank case, the compartments of the casing being arranged and adapted for the passage of the lubricant from one to the other so that it may reënter the crank case without interfering with the escape of the air discharged from the crank case.

3. A combined air and oil valve embodying a casing having a partition subdividing said casing into communicating chambers or compartments, means for admitting air to one of said compartments, and admission and discharge valves for the respective compartments.

4. A combined air and oil valve embodying a casing having an air admission mouth, said casing having a wall reëntering said mouth, a partition in the casing which terminates short of the reëntrant part aforesaid, thereby leaving an opening by which the compartments of the casing are placed in communication, a discharge valve for the compartment which is in communication with the mouth aforesaid, and an admission valve for the other compartment.

In testimony whereof, I hereunto affix my signature in presence of two witnesses.

CLARENCE WHITTINGTON JACKSON.

Witnesses:

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HANS E. HANSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."