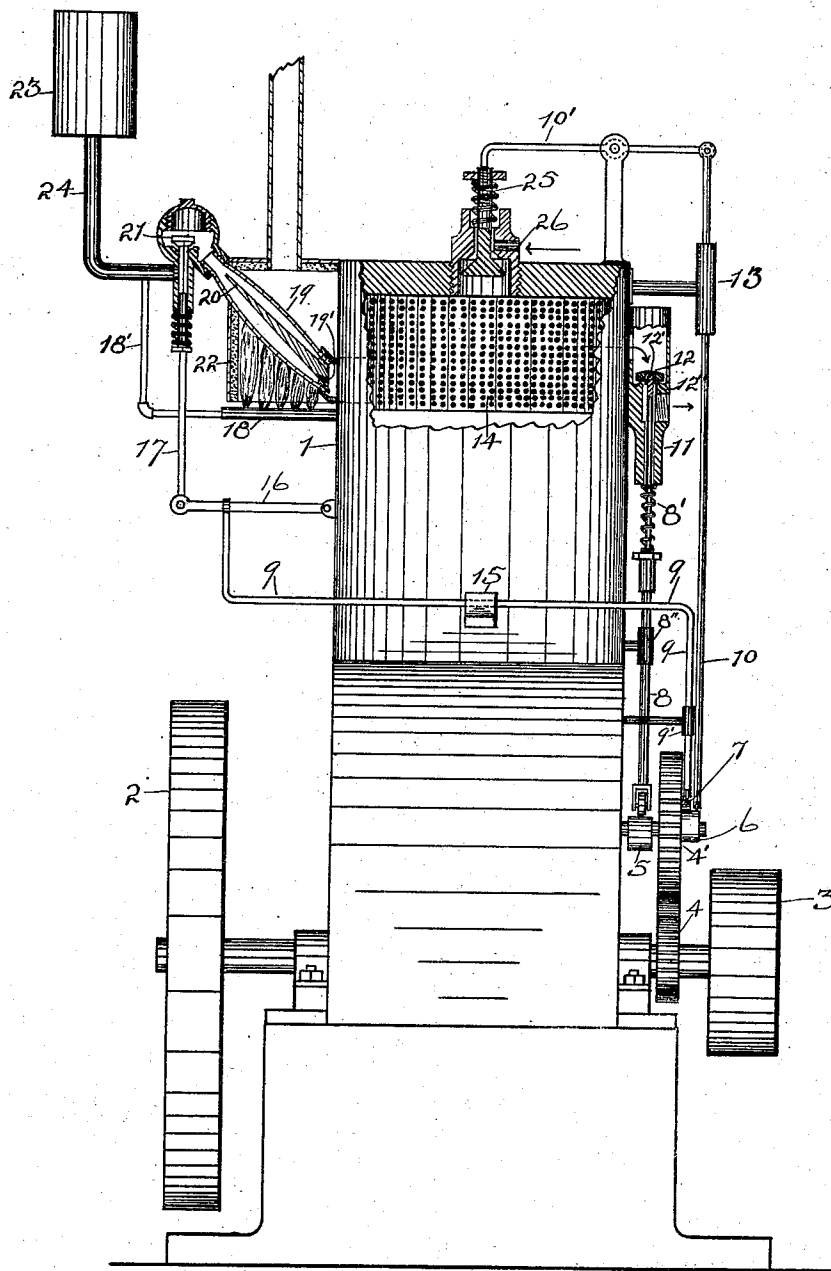


(No Model.)

J. ROBISON.
GAS, OIL, OR VAPOR ENGINE.

No. 532,098.

Patented Jan. 8, 1895.



Witnesses:
J. F. Harris:
A. M. Turner

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UNITED STATES PATENT OFFICE.

JOSEPH ROBISON, OF GREENBUSH, ASSIGNOR OF TWO-FIFTHS TO JESSE P. MILLS AND GEORGE HIBSCH, OF ALBANY, NEW YORK.

GAS, OIL, OR VAPOR ENGINE.

SPECIFICATION forming part of Letters Patent No. 532,098, dated January 8, 1895.

Application filed May 24, 1894. Serial No. 512,309. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ROBISON, a citizen of the United States, residing at Greenbush, Rensselaer county, New York, have invented certain new and useful Improvements in Gas, Oil, or Vapor Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms a part of this specification.

The object of my invention is to provide a new and improved gas, oil or vapor engine.

In the drawing the figure shows a side elevation of a vertical gas, oil or vapor engine with my vaporizing and ignition tube and its heating jacket, my gas and air mixer and my exhaust valve shown in vertical section.

In the drawing the numeral 1 shows the engine cylinder; 2, the fly-wheel; 3, the belt wheel; 4 and 4', gear wheels in the relation of two to one; 5, a cam on the journal of the gear 4, by which the exhaust valve 12' is operated, said valve 12' having its stem pivoted to the valve by a ball and socket joint 12 and a sharp edged seat for the valve 12'', the valve stem having a spring 8' bearing against a nut and acting to close the valve, said nut having a hollow or tubular extension in which the rod 8 loosely plays up and down, said rod 8 having an antifriction wheel at its lower end rolling over the cam 5, said rod 8 passing through a steadying sleeve 8''.

The cam 6 operates the rod 10 which passes through the steadying sleeve 13 and is pivoted to the lever 10' said lever at its outer end attached to the valve stem 25 and operating to force that valve open in order to allow an inflow of air through opening 26 into the cylinder. On cam 6 is a crescent 7 which operates the rod 9 which passes through the steadying sleeve 9' and the bracket 15 and at its outer end is yoked to the pivoted lever 16 which lever is also pivoted to the upright arm 17 which acts to open the oil valve 21 against the pressure of the spring about its stem.

19 shows my vaporizing and ignition tube having a copper or other metallic stem 20

passing through or into it and connected to the outer end of the vaporizer and igniter is the valve 21 and its casing. About the ignition and vaporizing tube 19 is a heating jacket 22 and under the jacket is a source of heat 18 preferably a vapor or oil burner and preferably supplied with fuel through pipe 18' from pipe 24 which pipe 24 leads to a tank of oil 23.

In the cylinder will be seen a perforated annular sieve 14 which is preferably made of strong material like boiler plate and finely perforated and attached preferably to the head of the cylinder 1 in any well known manner as by bolting it fast thereto, the diameter of the annular sieve being preferably somewhat less than the inside diameter of the cylinder so as to leave a slight space between the sides of the sieve and the inside surface of the cylinder, and hanging down into the cylinder sufficiently to receive the charge of gas or vapor from the ignition and vaporizing tube 19.

A complete understanding of the engine will be derived from the following explanation of its operation.

The tank is charged with oil, preferably 150° proof or test kerosene. The oil is then lighted in the burner 18 and allowed to burn until tube 19 is heated to redness. Fly wheel 2 is now turned when the gears 4 and 4' will set in motion the cams 5, 6, and the crescent 7. As the crown of the cam 6 rises to its highest point or to any point predetermined, the arm 10 rises forcing the free end of lever 10' to press down the air valve 25, the piston of the engine being on its down or suction stroke. Crescent 7 has also operated to raise arm 9 and force lever 16 upward which forces valve 21 off its seat allowing a charge of oil from tank 23 to enter through that valve and pass into the ignition and vaporizing tube 19 where the oil is vaporized by coming in contact with the heated surfaces of the tube and with heated stem 20 and this vapor passes through openings 19' about the base of stem 20 into the engine cylinder and through the sieve 14. As the piston rises on its compression stroke, the oil vapor or gas and the air that have been sucked into the cylinder by the suction stroke of the piston, are now compressed and

forced through the sieve 14 and thoroughly mixed and a part of the mixed oil-vapor or gas and air is forced back into the ignition tube 19 and ignited which causes the necessary explosion in the engine cylinder. The piston now descends again and at a point which is five sixths of its downward stroke the cam 5 begins to operate so as to raise the exhaust valve 12' and the products of combustion are discharged through this valve as indicated by the small arrow.

The engine will be understood as operating on what is universally known as the Otto cycle. As the piston rises on its compression stroke valves 21 and 25 are closed.

The valve 12', the ignition and vaporizing tube 19, the sieve 14 and the method of operating the valves 21, 12' and 25 by positive movement are the new and novel features in this engine shown and described.

The valve 12' has a ball and socket connection 12 with its stem and a sharp or knife edged seat 12'' in order that the valve 12' may be seated by the downward pull of the stem and have an even bearing on its seat under all circumstances whether sediment collects on the under side of the valve or not or whether any foreign substance rests on the knife edged seat or not, the knife edged seat cutting through any substance that will ordinarily present itself to it. The sieve 14 acts as a strainer to the oil vapor and air that enters the cylinder on the suction stroke of the piston and still more so on the compression stroke, as during the compression stroke the mixed gas and air is forced more or less through the fine perforations and thoroughly mixed, that portion of the mixture re-entering the ignition and vaporizing tube being compelled

to pass through the sieve and is thoroughly mixed ready for ignition.

The drawing represents the engine and valves in position during the suction stroke of the piston.

My ignition and vaporizing device, the sieve and the intake valve may be used on a horizontal vapor or gas engine as well as on a vertical one, and while I have shown one form of an engine and one form only of arrangement of my improved devices above named I do not confine myself to the exact form shown nor to the exact manner of arrangement shown as I claim them broadly in whatever manner used.

Having described my invention so that those skilled in the art to which it appertains may make and use the same, what I claim, and desire to secure by Letters Patent, is—

In an oil or vapor engine an ignition and vaporizing device having an intake valve arranged to receive its supply of oil below the valve by gravity and by gravity to pass the oil through the valve when the valve is opened and having means whereby the valve is opened and closed automatically at predetermined times, the ignition and vaporizing tube having a heat retaining body located inside thereof and ports leading therefrom into the cylinder and a source of heat to heat the ignition device and a nonconducting jacket therefor substantially as described.

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

JOSEPH ROBISON.

Witnesses:

J. F. HARRIS,

W. M. BROWN.