(No Model.)

J. ROBISON.

GAS OR OIL ENGINE.

No. 565,033. Patented Aug. 4, 1896.

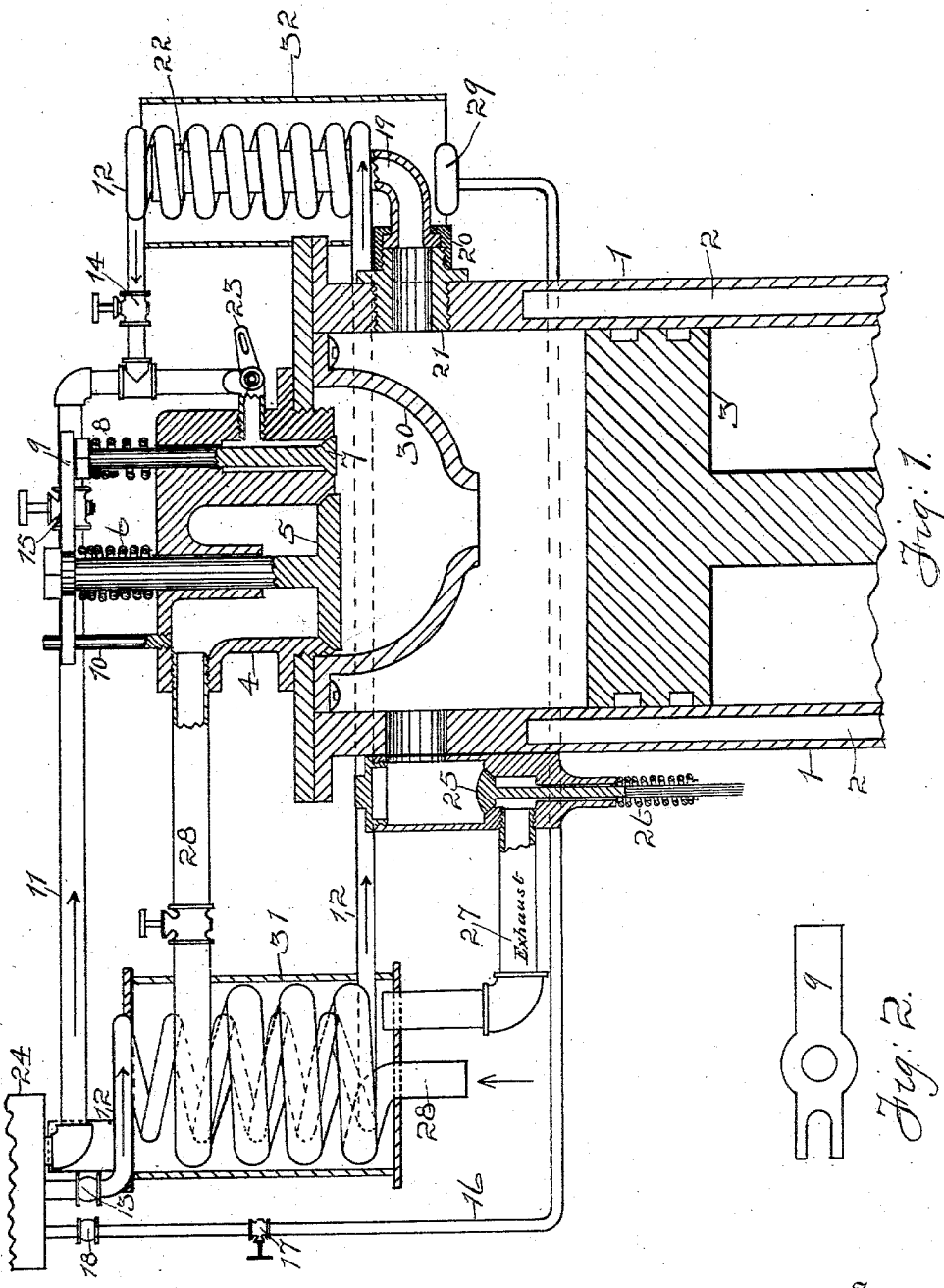

Fig. 1.

Fig. 2.

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

Inventor
Joseph Robison.
By his Attorney
W. M. Brown

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH ROBISON, OF GREENBUSH, NEW YORK.

GAS OR OIL ENGINE.

SPECIFICATION forming part of Letters Patent No. 565,033, dated August 4, 1896.

Application filed October 24, 1894. Serial No. 526,794. (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 or Oil 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 drawings, and to the figures of reference marked thereon, which form a part of this specification.

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

In the drawings, Figure 1 shows a vertical sectional view of the engine-cylinder, the operating-valves, and a side elevation of the air and oil pipes; and Fig. 2, a top view of the valve-operating yoke.

The numeral 1 shows the cylinder, 2 the water-space, and 3 the piston.

4 is a screw-plug chambered so as to take and allow valves 5 and 7 to operate and having inlets for air coming through pipe 28 and for gas or oil coming through pipes 12 or 11. The valve 5 has a spring 6, which holds it closed except when the piston 3 makes a suction stroke, and valve 7 has a similar spring 8, operating in the same manner in relation to that valve.

The oil is fed to the cylinder in either of two ways, as may be desired, as follows: 24 shows a tank of oil arranged, preferably, to supply the oil by gravity. When the engine is first started, valve 15 is opened, when the oil will pass through pipe 11, as indicated by the arrow, past valve 23 and into the space about the stem of the valve 7, and on each suction stroke of the piston 3 valve 7 will open and supply a charge of oil to the cylinder through the inner receiver 30; but after the engine has run a sufficient time to become thoroughly heated valve 15 is closed and valve 14 opened, when the oil will flow through pipe 12 and its two coils and thence into the cylinder. As the pipe 12 passes through casing 31, into which the exhaust discharges through pipe 27, the oil is somewhat heated before it leaves this coil, from which it passes into the coil in jacket 32, where, on account of the heat engendered by burner 29, it is vaporized and as vapor passes into the engine-cylinder through valves 23 and 7. In order to also supply a charge of more or less heated air to the cylinder, the intake air-pipe 28 is passed into the jacket 31 and preferably coiled, the lower or open intake end preferably protruding from the jacket that it may get a supply of fresh air, said pipe and its coil being heated by the exhaust from the engine. In pipe 12 I place a check-valve 13, so that when valve 14 is closed any vapor in pipe 12 cannot blow back into the oil-tank. In the cylinder I place a receiver 30, which becomes highly heated by reason of the heat engendered by the explosions in the cylinder, and which receives on its side any particles of oil passing through valve 7 and vaporizes them, the vapor passing through the open mouth of the receiver into the cylinder along with the charge of air passing valve 5. The ignition-tube 19 is attached to the cylinder, preferably as shown, its free end passing into jacket 32 and through coil 12 and has a screw-cap 22 turned upon its upper end, the coupling 20 holding it removably to the screw-plug 21, which is practically a part of the cylinder and preferably screwed therein.

In connection with the stems of valves 5 and 7 I use a yoke-piece, (plainly seen in Fig. 2,) the circular opening therein embracing the upper end of the stem of valve 5 and held thereto by the nut above it, while the yoked end embraces the standard 10 and moves vertically on it, the solid end resting on the top of the stem of valve 7, and it is so arranged in order that when the piston makes a suction stroke and draws the valve 5 down the yoke-piece will assist in forcing the valve 7 open by pressing downward on its stem. Pipe 16 supplies the burner 29 with oil through check-valve 18 and valve 17. The jackets 31 and 32 are composed of any non-conducting material desired.

25 shows the exhaust-valve, kept closed by the spring 26 except when the stem is acted on by the eccentric or other mechanism usually used for that purpose with all similar engines.

Valve 23 has a slotted handle which is con-

nected to the rod of the governor, (governor not shown,) whereby the supply of oil is regulated to the load the engine is carrying.

The operation is as follows: Valve 17 being opened, the burner 29 is supplied with oil and may be lighted, the heat engendered heating ignition-tube 19 sufficiently to ignite the mixed vapor and air entering into the compression stroke of the cylinder, and also heats coil 12, the products of combustion passing out of the upper end of the jacket 32, from whence it may be led away by a suitable pipe to a chimney-flue, if desired. When coil 12 has become suitably heated, valve 14 is opened, when the oil will flow through check-valve 13 and pipe 12 and its coil in jacket 31 to and through the heated coil in jacket 32, where it will be vaporized, and the vapor will then pass valve 14 and enter through valve 23 to the cylinder by way of valve 7, when the piston 3 makes a suction stroke, but if there should be any of the oil not vaporized it will fall on the sides of receiver 30, and that receiver being heated by the explosions in the cylinder such unvaporized oil will be thoroughly vaporized. As the piston makes a suction stroke valves 5 and 7 open, valves 7 letting the vapor pass into receiver 30, while the charge of air will be sucked through pipe 28 and its coil in jacket 31, and after the engine has run a short time the heat from the exhaust will heat this air, so that heated air will be supplied to the cylinder instead of cold air, and while the coil of pipe 28 is being heated, as aforesaid, the oil-supply pipe 12 is also being heated in the jacket 31, thus making a still more perfect vaporization of the oil. As valve 5 is drawn open by the suction stroke of the piston yoke 9 is drawn downward and its end presses valve 7 down with it, making a certain opening of that valve. On the exhaust stroke of the piston the products of combustion are passed through valve 25 and pipe 27 into jacket 31, where it heats the two coils in that jacket with the results already described. On the compression stroke of the piston the mixed vapor and air are forced into the ignition-tube 19, and the same being heated sufficiently by the burner 29 the vapor and air are exploded and reënter the cylinder and operate the piston in the usual manner.

In case it should be desirable to use the engine without using oil-supply pipe 12, valve 14 may be closed, when check-valve 13 will prevent the heated vapors in that pipe from blowing back into the oil-tank, and on opening valve 15 in pipe 11 the oil will be supplied to the cylinder through valve 23 and valve 7 and be vaporized against the heated sides of receiver 30, and this arrangement is desirable, as in case an accident to pipe 12 occur, or it be desirable to repair or renew it, this may be done without stopping the engine. On the stem of valve 5 will be seen a nut above the yoke 9 and on the stem of valve 7 a nut under said yoke. By turning these nuts up or down the extent of the opening of valve 7 is regulated.

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

1. In an oil or gas engine, a fuel-supply pipe 12 having two coils formed therein and two casings 31 and 32 for the said coils, in combination with an exhaust-pipe entering the former casing, a burner arranged to heat the latter casing and an ignition-tube arranged to be heated by the said burner and passing up through the proximate coil of the said pipe so as to additionally heat the same substantially as set forth.

2. In an oil or gas engine, the combination of a fuel-inlet valve with an air-inlet valve a yoke resting on the former and attached to the latter valve and having one end bifurcated and a fixed guide received between the bifurcations of the said yoke substantially as set forth.

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

JOSEPH ROBISON.

Witnesses:
T. F. HARRIS,
A. M. TURNER.