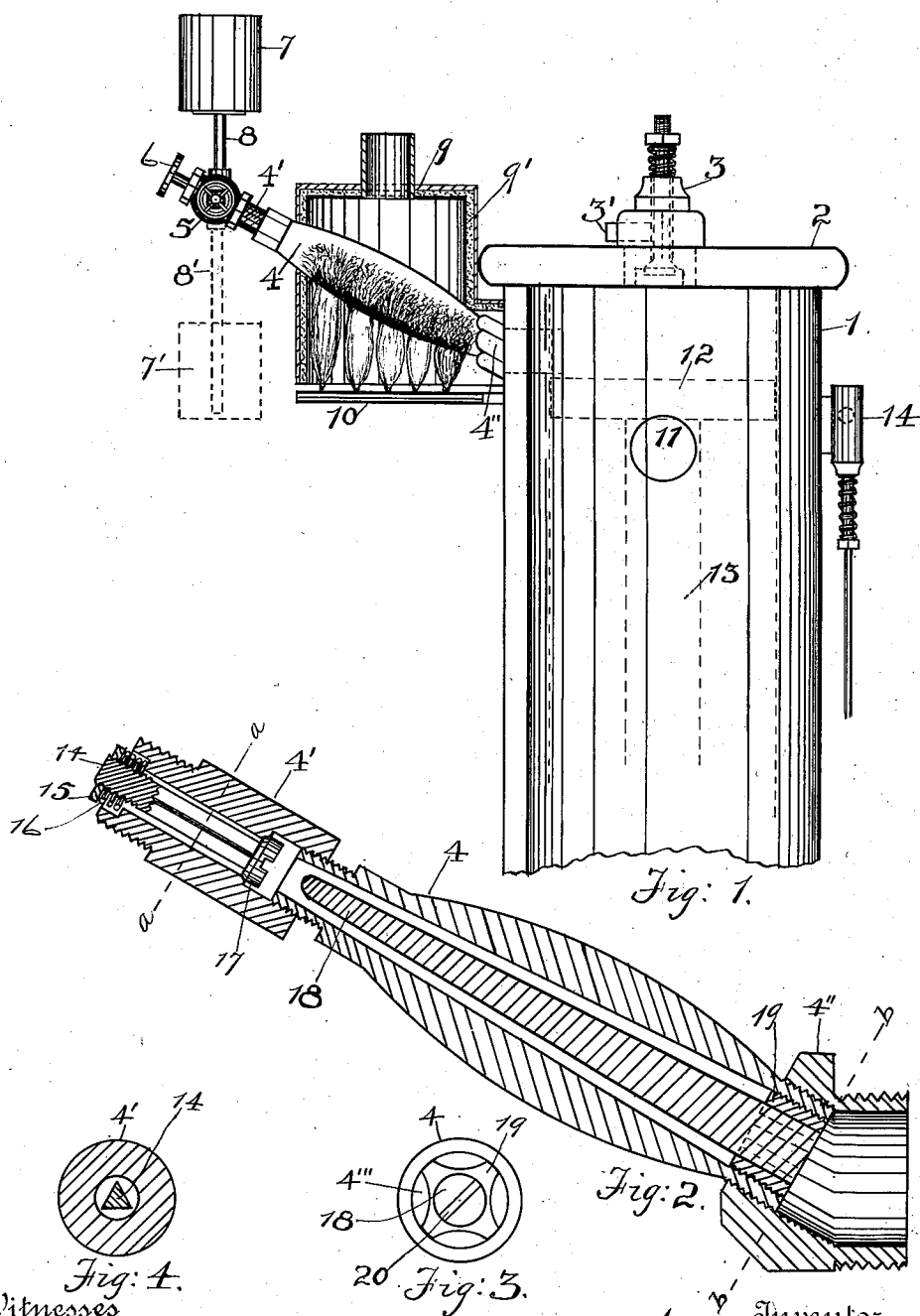


(No Model.)

J. ROBISON.
VAPORIZING AND IGNITION DEVICE.

No. 532,097.

Patented Jan. 8, 1895.



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

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

UNITED STATES PATENT OFFICE.

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

VAPORIZING AND IGNITION DEVICE.

SPECIFICATION forming part of Letters Patent No. 532,097, dated January 8, 1895.

Application filed May 24, 1894. Serial No. 512,308. (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 Vaporizing and Ignition Devices; 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 vaporizing and ignition tube for oil or vapor engines.

In the drawings, Figure 1 shows a side elevation of a portion of the cylinder of a gas, oil or vapor engine with a similar view of my ignition and vaporizing device and the heating jacket therefor in vertical section; Fig. 2, an enlarged longitudinal sectional view of my vaporizing and ignition device; Fig. 3, an end view of the ignition tube taken on line *b. b.* of Fig. 2, and Fig. 4, a cross sectional view thereof taken on line *a. a.* of that figure.

The numeral 1 shows the engine cylinder which may be in any form desired and be either horizontal or vertical.

2 indicates the head thereof and 3 an air valve to admit a charge of air into the cylinder 1 as the piston descends forming a sufficient vacuum in the cylinder to unseat the valve 3 and overcome the upward pull of the spring seen under the nut on the valve stem, the air being taken in through the opening 3'.

4 shows the body of my vaporizing and ignition device which consists of any strong metal and is hollow and preferably set in connection with the cylinder 1 in a slanting position. The device or tube 4 has a valve chamber 4' and to the valve chamber is preferably attached an ordinary valve 5 and is put in connection with an oil supply 7 by means of a pipe 8 or in any other manner desired.

The tank 7 shows the oil as being fed by gravity, but the tank 7', shown in dotted lines, shows the oil as being arranged to be fed by suction to the ignition and vaporizing tube. This tube 4 may be attached to the cylinder

by an angle bush 4'' as shown, or it may be flanged and bolted to the cylinder 1 or affixed thereto in any well known manner. Inside the tube 4 is a copper stem 18 which is fastened in an annular nut 19 and the nut screwed into the large end of the tube 4, said nut 19 having a portion of its sides removed as seen at 4''' so that there may be ingress and egress past the nut into and out of the tube 4, and in the end of the copper stem I form a slot 20 to take a screw driver that the stem 18 may be easily put in and taken from the tube 4. The end of the nut 19 and copper stem 18 and the openings 4''' will be clearly seen in Fig. 3 which is a view taken of Fig. 2 on line *b. b.*

In the valve chamber 4' is a valve 17 having a triangular stem 14 ending in a circular threaded end to receive the nut 15 and about the circular threaded end is the coiled spring 16 which acts to keep valve 17 closed, its pressure being but sufficient to close it when there is no vacuum in the chamber 4'. A cross section of the chamber and triangular portion of the stem will be clearly seen in Fig. 4, the triangular portion allowing of the oil to flow down to the valve when it is closed and beyond it when open. Referring to Fig. 1 my vaporizing and ignition tube will be seen inclosed in a heating jacket 9 which may be made of sheet iron or other desired material and I have shown its interior surfaces covered with a nonconductor of heat 9', preferably consisting of asbestos and under the jacket is a source of heat 10, preferably a vapor burner.

At 14 will be seen the ordinary exhaust valve used with many gas engines and at 11 the opening to the water jacket of the cylinder, the piston and its rod being shown in dotted lines at 12 and 13.

The operation is as follows: The engine will be considered to be working on the Otto cycle. Valve 6 being open to allow a flow of oil through valve 5 and to valve 17, the piston 12 will on its down or suction stroke produce a vacuum in the top of the cylinder which will create a vacuum also in the tube 4, and the vacuum will cause the valve 17 to open and allow a quantity of oil to enter tube 4 and also cause air valve 3 to open and allow a

charge of air to enter the cylinder 1. As the oil enters tube 4 that tube will be heated to redness by the source of heat at 10 and the oil will be vaporized and its volume being thus greatly increased it will force itself through the tube 4 and openings 4''' into the cylinder and thereby mixed with the air taken in through valve 3. On the up-stroke or compression stroke of the piston, the mixture of oil vapor and air will be forced in part out of the cylinder and into the red hot tube 4 where it will be ignited and cause the necessary explosion of the mixture required to keep the engine in motion. At the proper moment the exhaust valve will open and the exhausted products of combustion will escape therefrom as in other gas engines a particular description thereof being deemed unnecessary as I claim nothing new or novel in this specification regarding the exhaust valve.

I have made use of the stem 18 in order to reduce the area of the opening in the tube 4 and also as a retainer of the heat in that tube, it assisting to vaporize the oil. When the oil tank is located below the mouth of the tube 4, as seen in the dotted lines in Fig. 1, the suction produced by the vacuum in the tube will suck up or cause to rise into that tube sufficient oil for each charge to the tube. It will be seen, therefore, that my device is calculated more especially for the purpose of utilizing oil with vapor engines, the oil I find best adapted for use being 150° or proof kerosene oil, and as that oil is perfectly safe to handle under ordinary temperatures up to 150° Fahrenheit there is no danger of the supply tank giving off explosive vapors as there is when gasoline or the lighter oils are used.

With my improvement in vaporizing and igniting the charge, it becomes perfectly practical for engines using my improvement to be used every where without danger from explosion and where it is impossible to obtain manufactured or natural gas and where gasoline and the lighter oils would be unsafe besides reducing insurance in such buildings where my improvement is used.

I am not aware that any kind of a device has ever been used with an oil or vapor engine whereby the oil was both vaporized and the mixed vapor and air exploded or ignited by one and the same device.

It will be noticed that the ignition and vaporizing tube 4 receives nothing but the charge of oil designed for it, no air or other explosive producing substance being received into it on the initial entrance of the charge of oil, the air that produces the explosive compound by admixture of the air and the oil vapor being

taken directly into the cylinder 1 as cool as the surrounding atmosphere, thus tending to partly cool the cylinder thus assisting the water in the water jacket about the cylinder in keeping the cylinder as cool as possible. The water jacket used with cylinder 1 is the same as is usually used with all gas engines and a detailed description is deemed unnecessary.

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—

1. In combination with an oil or vapor engine, an oil conduit arranged to discharge into the engine cylinder and having an automatic intake valve and an oil reservoir connected with said valve, and a jacket for said conduit and a source of heat arranged to heat the conduit to a degree sufficient to both vaporize the oil and also ignite the vapor when mixed with air, said conduit having an internally located body arranged to absorb a portion of the heat, substantially as described.

2. A vaporizing and ignition device for oil and vapor engines consisting of a tube affixed to the engine cylinder and discharging into the same, and arranged so that oil entered therein will by gravity flow down the tube, and an automatic intake valve arranged to open on the suction stroke of the piston, and an oil tank communicating with said valve and arranged to deliver its oil thereto by gravity and having a check valve arranged to govern the flow of oil from the tank to the intake valve, and a source of heat arranged to heat the tube to a degree sufficient to vaporize the oil and ignite the same when mixed with air and having a jacket for the tube, substantially as described.

3. A vaporizing and ignition device for oil and vapor engines consisting of a tube and a metal stem therein and ports leading from the tube into the gas engine cylinder and a valve chamber attached to the stem and containing an automatic acting valve arranged to open and close on the movement of the engine piston and a check valve arranged to limit the supply of oil to said automatic valve and an oil supply discharging into said valve and a source of heat arranged to heat the tube to a degree sufficient to both vaporize the oil and ignite the vapor when mixed with air and a jacket for the tube, substantially as described.

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

JOSEPH ROBISON.

Witnesses:

J. F. HARRIS,
W. M. BROWN.