No. 877,890. PATENTED JAN. 28, 1908.

G. H. GERBER & A. WEILAND.

VAPORIZER.

APPLICATION FILED JUNE 8, 1907. 2 SHEETS—SHEET 1

Fig. 1.

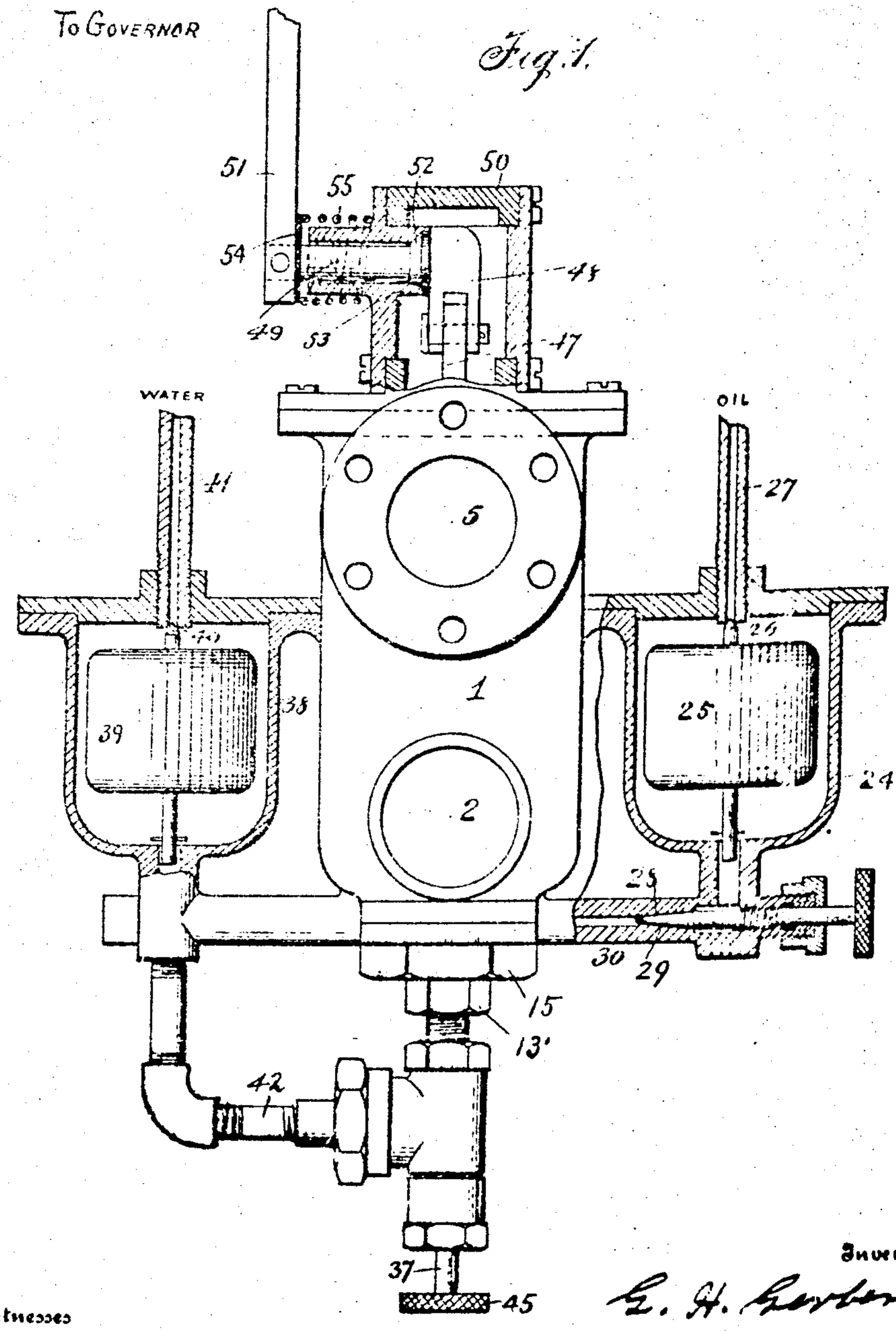

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Fig. 2.

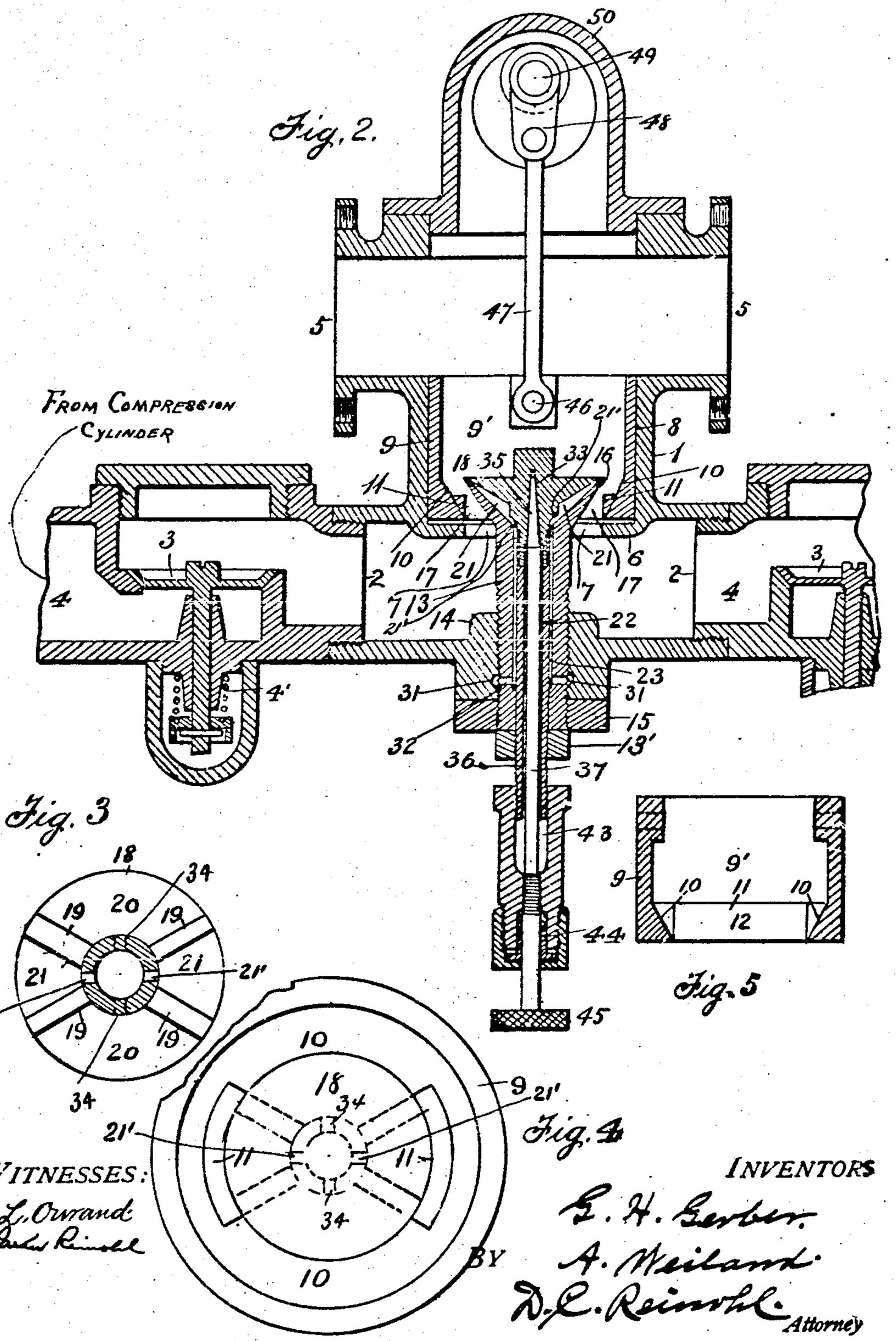

Fig. 3

Fig. 5

Fig. 4

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GEORGE H. GERBER AND ALFRED WEILAND, OF READING, PENNSYLVANIA; SAID WEILAND ASSIGNOR TO SAID GERBER.

VAPORIZER.

No. 877,890. Specification of Letters Patent. Patented Jan. 28, 1908.

Application filed June 8, 1907. Serial No. 377,879.

To all whom it may concern:

Be it known that we, GEORGE H. GERBER and ALFRED WEILAND, citizens of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Vaporizers; and we 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.

Our invention relates primarily to explosive gas engines, and has especial reference to vaporizers, has for its object economy in use of hydrocarbon oil in the preparation of an explosive gaseous mixture for engines, and consists in certain improvements in construction, whereby the flow of the oil is induced, the oil heated and converted into gas by air under pressure in transit around the nozzle or spray-head of the vaporizer in a passage, whose area is varied to regulate the power of the engine according to the load on the engine or the work required to be done, as will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification: Figure 1 represents a side elevation partly in section of a mixer and vaporizer embodying our invention. Fig. 2 a vertical transverse section of the same. Fig. 3 an inverted plan view of the head of the spray-head or vaporizer, on an enlarged scale. Fig. 4 a top plan view of the governor or throttle valve detached, and on an enlarged scale, and Fig. 5 a vertical section of the same.

Reference being had to the drawings and the indicating characters thereon, the numeral 1 indicates the case or body of the mixer and vaporizer, 2, 2, air inlets or induction passages constructed to be connected to a compression end of one or more engine cylinders, not shown, to supply air under pressure, 3, 3, are check valves in the supply pipes 4, 4, held to their seats by springs 4', 4', and opened or raised by the pressure of the air.

5, 5, are gas outlet or eduction passages, from which a gaseous mixture or carbureted air is conducted to one or more explosive engine cylinders, not shown. When only one cylinder is used one of the air inlet passages and one of the gas outlet passages are closed, the closure being made in opposite sides of the case to prevent interfering with the natural flow of the air and the gas.

6 is a transverse partition in which is an opening 7, and above the partition is a chamber 8.

9 indicates an annular governor or throttle valve, which normally rests on the partition 6, and is provided with a mixing chamber 9' and with an inwardly projecting and inclined annular seat 10, on which are vertical projections 11, 11, of a width equal to the width of the water discharge passages in the vaporizer or spray-head, and is provided with an opening 12 as will hereinafter more fully appear.

13 indicates the body of the nozzle adjustably secured in a boss 14 by a screw-threaded connection therewith, and is provided with a nut 15 to set the nozzle in proper relation to the opening 7 in the partition 6, and the opening 12 in the governor or throttle valve 9. The nozzle 13, is tubular or hollow and is provided with a conical upper end 16, the angle of whose exterior corresponds with the angle of the seat 10 to form an annular passage 17 between the part 16 and the seat 10, the purpose of which is to increase the velocity of the air in transit through the passage 17, and heat the oil in the nozzle, draw or suck the oil out of the nozzle and convert the oil into gas as it issues from the nozzle and commingles with the air in the mixing chamber 9' in the throttle valve.

18 is the head of the nozzle, on whose underside are ribs 19, forming oil chambers 20, 20 and water chambers 21, 21, the former being of greater area than the latter. The head 18 may be detachably connected to the tubular neck 22 which extends through the body 13 and is secured by a nut 13' and forms an annular water chamber 23, from which the water issues into the chambers 21 through passages 21', and is supplied automatically from a reservoir 24 controlled by a float 25 with a valve 26 engaging the end of the water supply pipe 27, and by a needle valve 28 engaging a seat 29 in pipe 30, from which pipe water flows into chamber 31, and then through ports 32 into the chamber 23.

The water-chamber 31 is of sufficient

width to allow the body 13 to be adjusted vertically for the purpose of setting the head 18 in proper final relation to the wall 10 of the valve 9, without throwing the ports 32 out of register therewith.

Within the head 18 of the nozzle or spray-head is a conical valve seat 33, from which extend lateral ports or passages 34, regulated by a needle valve 35 extending through the neck 22 and forming an annular oil chamber 36 around the stem 37 of the needle valve. The ports 34 communicate with the oil chambers 20 on the underside of the head 18 of the nozzle, and oil is supplied automatically to the chamber 36, from a reservoir 38 and controlled by a float 39 having a valve 40 engaging the end of the oil supply pipe 41. The oil flows from reservoir 38, through pipe 42 into chamber 43 and then up into passage 36, and is regulated by the needle valve 35 whose stem 37 extends through the stuffing-box 44, and is provided with a disk 45.

The throttle valve 9 is provided with a transverse pin 46 engaged by a rod 47 connected to a crank 48, whose shaft 49 extends through the wall of the cap or housing 50 and is attached to a rod or lever 51 which may be operated manually or by a connection with a governor, not shown, to raise and lower the throttle valve 9 to graduate the area of the contracted passage 17 and thereby regulate the supply of air, and cut off the supply of water by the projections 11 closing the water discharge passage in the vaporizer.

Water is supplied in sufficient quantity to maintain the temperature of the walls of the explosion chamber in the engine cylinder at such a point as to prevent premature ignition of the gaseous mixture therein, and the supply of the water is regulated according to the work on the engine by the manipulation of the throttle valve and its projections 11.

On the shaft 49 is a conical head 52 which engages a conical seat 53, and surrounding the boss 54 is a helically coiled spring 55, to hold the head 52 to its seat and prevent the escape or leakage of gas around said shaft.

In the operation of the device, the supply of the liquid fuel and the water is maintained automatically at a constant level in the chambers 20 and 21 by the floats 25 and 29 in the respective reservoirs 24 and 38. Air from the air compression chamber of the engine travels through the passage 17 and induces the flow of the oil and water from the chambers or reservoirs 20 and 21 respectively in greater or less quantities as the load on the engine varies.

It is obvious that changes may be made in the form and in the details of construction without departing from the spirit of our invention.

Having thus fully described our invention, what we claim is

1. A vaporizer provided with an inlet passage for air, an outlet passage for gaseous vapor, a passage between said air and vapor passages, and an adjustable liquid fuel and water supply nozzle concentrically arranged in the latter passage, forming one wall thereof, and from which the liquid fuel and water are discharged into the air in transit through said passage.

2. A vaporizer provided with an inlet passage for air, a valve in the passage, an outlet passage for gaseous vapor, an annular passage between said air and vapor passages, and an adjustable liquid fuel and water supply nozzle in the latter passage, forming one wall thereof and from which the liquid fuel and water are discharged into the air in transit through said passage.

3. A vaporizer provided with air inlet passages, outlet passages for gaseous vapor arranged in a plane parallel with the plane of the air passages, an annular passage between said air and vapor passages, and an adjustable liquid fuel and water supply nozzle in the latter passage and forming one wall thereof.

4. A vaporizer provided with an air inlet passage, an outlet passage for gaseous vapor, a contracted passage between said air and vapor passages and a liquid fuel and water supply nozzle adjustable in said contracted passage to vary the area thereof, and whose discharge is induced by the air in transit.

5. A vaporizer provided with an air supply passage, and a vapor discharge passage, an annular passage between said air and vapor passages, a valve controlling the latter passage, and a liquid fuel supply nozzle forming one wall of said passage and adjustable therein to vary the area thereof, and arranged in the path of the air and heated thereby.

6. A vaporizer provided with an air supply passage, and a vapor discharge passage, an annular passage between said air and vapor passages, a liquid fuel supply nozzle arranged in the latter passage and adjustable therein to vary the area thereof, and a valve for varying the area of said latter passage.

7. A vaporizer provided with an air supply passage, and a vapor discharge passage, a passage between said air and vapor passages, a liquid fuel supply nozzle in the latter passage, adjustable therein to vary the area thereof, and a valve for varying the area of said latter passage.

8. A vaporizer provided with an air supply passage, and a vapor discharge passage, a passage between said air and vapor passages, and a liquid fuel supply nozzle adjustable in the latter passage to vary the area thereof.

9. A vaporizer provided with an air supply passage, and a vapor discharge passage, a passage between said air and vapor passages, a liquid fuel and water supply nozzle adjustable in the latter passage to vary the

area thereof, and means for automatically controlling the supply of fuel under varying loads on the engine.

10. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage between said air and vapor passages, a liquid fuel and water supply nozzle in the latter passage and adjustable therein to vary the area thereof, and means for automatically regulating the supply of air and the supply of fuel under varying loads on the engine.

11. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage between said air and vapor passages, a liquid fuel and water supply nozzle, and means for automatically regulating the area of the latter passage and the supply of fuel and water under varying loads on the engine.

12. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage between said air and vapor passages, and a nozzle adjustable in the latter passage for varying the area thereof and for supplying liquid fuel and water intermediate said air and vapor passages.

13. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage between said air and vapor passages, an adjustable nozzle in the latter passage for supplying fuel and water and for distributing the water in the air and the fuel, and a valve for varying the supply of air, fuel and water automatically.

14. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage normally open between said air and vapor passages, and a fuel supply nozzle having a reservoir in its discharge end, arranged concentrically in the latter passage and adjustable therein to vary the area thereof.

15. A vaporizer provided with an air supply passage and a vapor discharge passage, a passage between said air and vapor passages, an adjustable fuel and water supply nozzle concentrically arranged in the latter passage, means for automatically regulating the supply of liquid fuel and water, and for regulating the supply of air through the latter passage under varying loads on the engine.

16. A vaporizer provided with an air inlet passage, and a vapor discharge passage, concentrically arranged fuel and water chambers, a passage between said air and vapor passages surrounding said fuel and water chambers, and means for varying the area of the latter passage under varying loads on the engine.

17. A vaporizer provided with an air inlet passage and a vapor discharge passage, a liquid fuel and water supply nozzle whose body extends through the case of the vaporizer and is adjustable from the outside of the case, a passage for air surrounding said nozzle, and a valve automatically adjustable for controlling the supply of air through the latter passage.

18. A vaporizer provided with an air inlet passage and a vapor discharge passage, a liquid fuel and water supply nozzle whose body extends through the case of the vaporizer and is adjustable from the outside of the case, a passage for air surrounding said nozzle, and a valve for controlling the supply of air through said latter passage, and provided with a mixing chamber.

In testimony whereof we affix our signatures, in presence of two witnesses:

GEORGE H. GERBER.
ALFRED WEILAND.

Witnesses:
ELMER W. DECK,
ALETHA HUYETT.