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Patented Apr. 15, 1902.

B. SETTERGREN.
MIXER OR VAPORIZER FOR HYDROCARBON ENGINES.

(Application filed Mar. 18, 1901.)

(No Model.)

Fig. 1

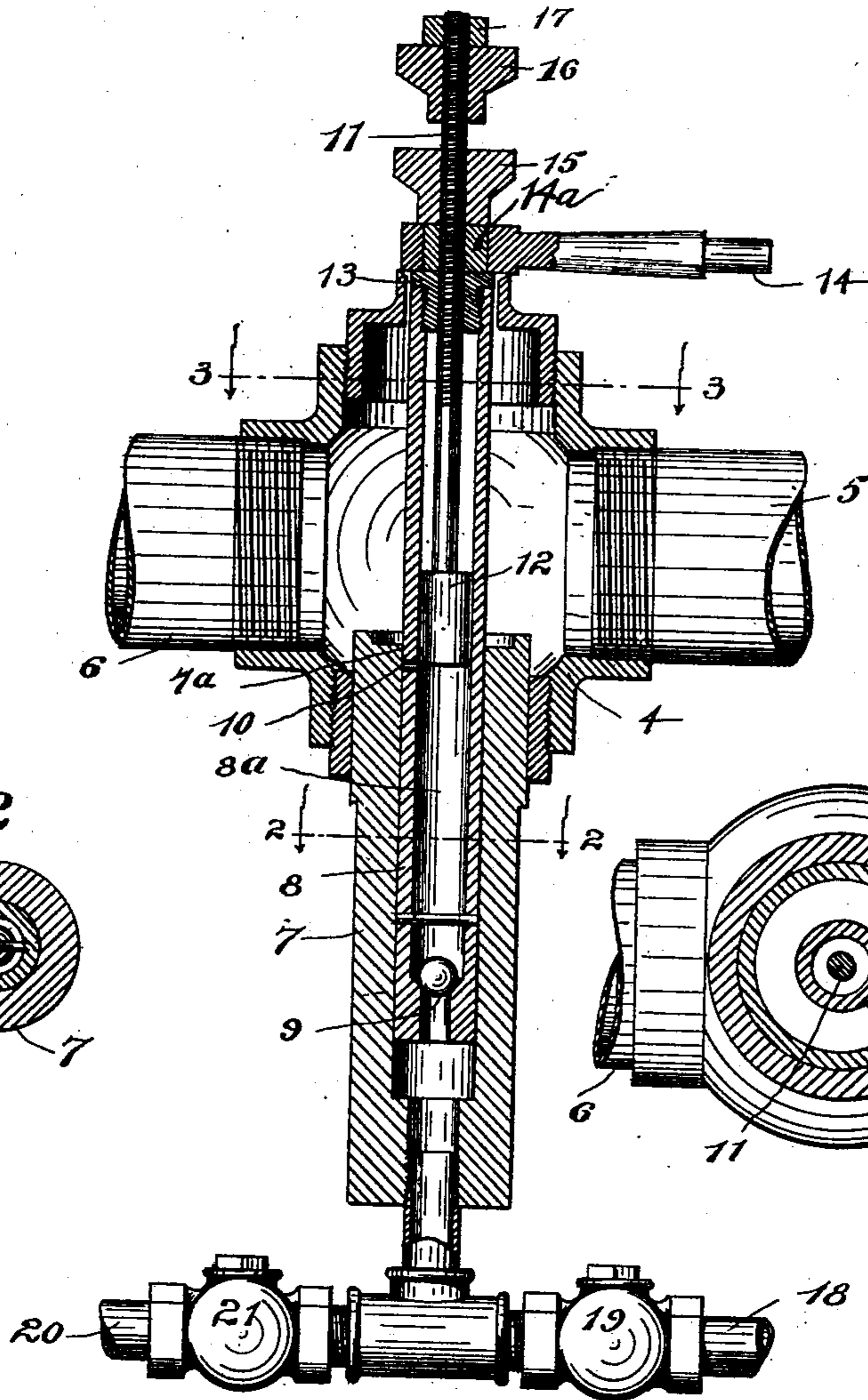


Fig. 2

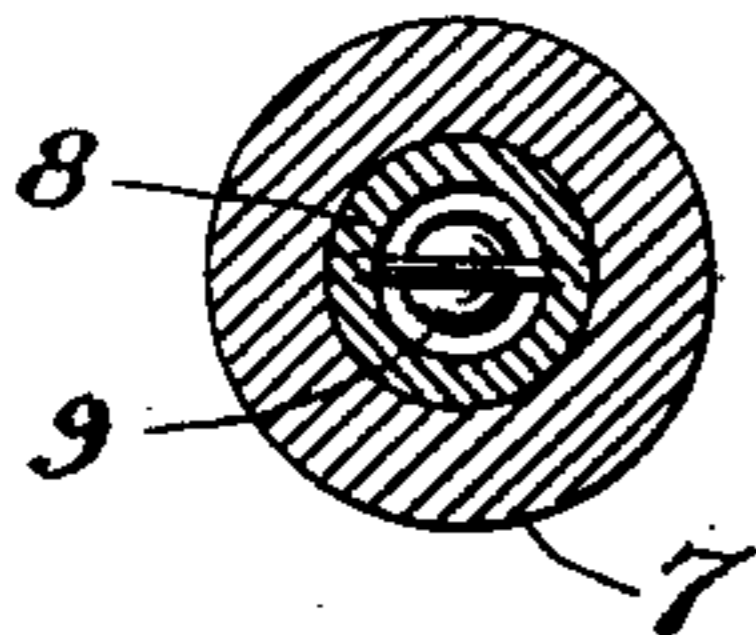
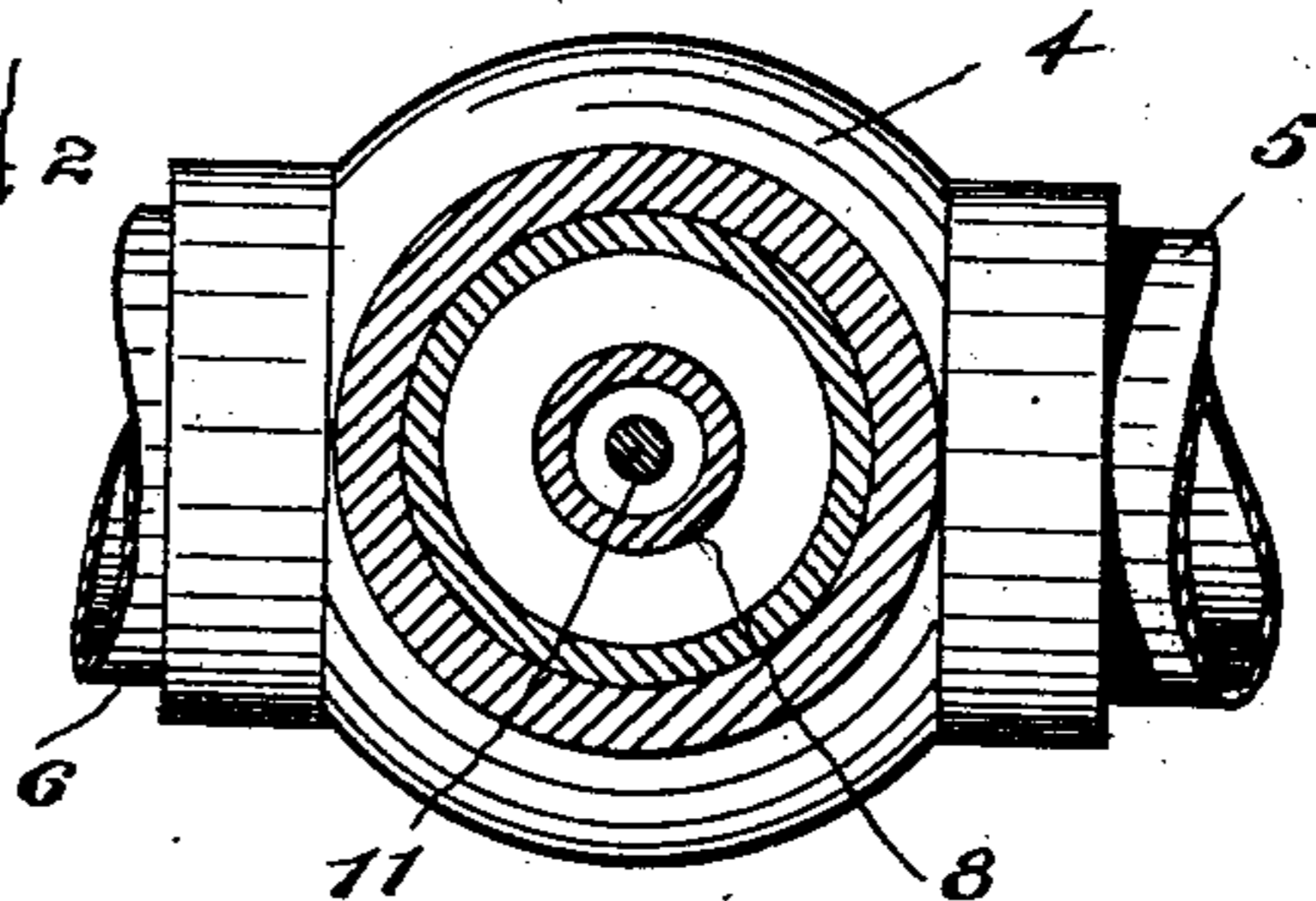


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

BERNHARD SETTERGREN, OF CHICAGO, ILLINOIS.

MIXER OR VAPORIZER FOR HYDROCARBON-ENGINES.

SPECIFICATION forming part of Letters Patent No. 697,555, dated April 15, 1902.

Application filed March 18, 1901. Serial No. 51,671. (No model.)

To all whom it may concern:

Be it known that I, BERNHARD SETTERGREN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mixers or Vaporizers for Hydrocarbon-Engines; and I do 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.

This invention relates to improvements in gasoline or explosion engines, and is designed to provide a mixer or vaporizer for such engines. It particularly comprises means for positively delivering a certain charge of oil or fluid to the vaporizer under all conditions.

Particularly in the use for marine purposes of gasoline or other hydrocarbon engines having a "drip" or gravity feed it has been found that the movement of the engine due to the rocking of the boat causes the feed to vary or fail, injuriously affecting the operation of the engine. My invention is adapted to give an invariable feed to such engines by the use of a pump, supplying definite and successive charges of oil to the mixing or vaporizing chamber, according to the stroke of the engine, and also comprises means for adjusting or regulating the amount of the charge so delivered.

Referring to the drawings, Figure 1 is a sectional elevation of the apparatus. Fig. 2 is a section on line 2 2 of Fig. 1, and Fig. 3 is a sectional plan on line 3 3 of Fig. 1.

A mixing or vaporizing chamber 4 is connected to the air-inlet pipe or passage 5 and to the delivery pipe or passage 6, leading to the cylinder of the engine. Attached to the chamber, working at substantially a right angle to the direction of the flow of air through the chamber, is a gasoline or oil pump, consisting of a cylindrical pump-casing 7, the upper end of which enters and is connected to the mixing-chamber, and a hollow cylindrical plunger 8, working within the casing and beyond the same within and across the mixing-chamber. The pump-plunger has an

8^a, communicating through the inlet ball-valve 9 in its lower end with the oil-supply pipe 18, leading from the reservoir, and the overflow-pipe 20, leading to the reservoir, and the said chamber is provided with a port 10 in the side of the plunger. Through this port in the operation of the pump the oil is discharged into the mixing-chamber. This port is so situated that it is closed during a part of the stroke of the plunger by passing below the edge 7^a of the pump-casing. There may be several of these ports preferably located in the same circumferential line. The oil-chamber 8^a is closed at its upper end by a screw-cap 13, which is tapped axially to receive a screw-threaded adjusting rod or stem 11, which has fixed to its lower end within and fitting the oil-chamber a head 12, which acts as a valve to adjustably open or close the port. The upper or outer end of the rod or stem is provided with a thumb-nut 16, held by a binding-nut 17, whereby the rod and head may be actuated to open or close the port wholly or partly and govern the delivery of oil. The binding-nut 15 is adapted to hold the rod when set as desired.

Motion is given to the pump-plunger by any suitable or convenient means. In the drawings is shown a laterally-extending arm 14, attached to the rod of the pump-plunger by being tightly fitted over a nut 14^a on the rod and secured by the binding-nut 15 and adapted to operate the plunger by connection with an eccentric on the engine-shaft or by any other suitable means.

A check-valve 19 in the supply-pipe 18 and a check-valve 21 in the overflow-pipe 20 open to and from the pump, respectively. The weight or resistance of the valve 21 is greater than that of the valve 9.

In operation the valve 9 closes and the valve 19 opens at the upward stroke of the pump-plunger, and oil is drawn from the oil-reservoir through the pipe 18 into the pump-casing, and the port 10 passes above the casing and opens into the mixing-chamber 4. The downward stroke of the plunger closes the valve 19 and opens the valve 9, (of less resistance than the valve 21,) and the oil contained within the plunger and casing is discharged through the port into the mixing-chamber, where it vaporizes and mixes with

the air entering the air-pipe 5, and the mixture is drawn through the pipe 6 by the suction of the engine into the cylinder. The connection between the pump and the engine
 5 is such that the inspiration of the engine is synchronous with that period of the downward stroke of the plunger during which the port is above the pump-casing. When the
 10 ing, the delivery of oil is stopped and the valve 21 opens under the pressure, permitting the discharge through the overflow-pipe of the excess of oil in the pump-casing.

It will be seen that at each stroke of the
 15 pump oil is positively delivered under pressure, assisted by the suction of the engine, and that vibration or rocking of the engine does not affect the operation or supply. Furthermore, the size of the port opening into
 20 the mixing-chamber can be adjusted to regulate the amount of oil delivered.

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

25 1. A mixer or vaporizer for hydrocarbon-engines consisting of a chamber through which the air passes on its way to the cylinder, a pump-casing opening into the chamber, a hollow plunger working in the chamber and casing,
 30 ing, an oil-inlet valve in that part of the plunger within the casing, and a discharge-port in the plunger adapted to open into the chamber during a portion of the stroke of the plunger and to be closed during the remainder of
 35 the stroke by passing within the casing.

2. A means of supplying oil to hydrocarbon-engines consisting of a pump-casing, supply and overflow pipes connected thereto, valves in said pipes, a plunger in the casing, a chamber in the plunger, said chamber having an
 40 inlet-valve opening under less pressure than the valve of the overflow-pipe and a discharge-port closed by the casing during a portion of the stroke.

3. A mixer or vaporizer for hydrocarbon-engines consisting of a mixing-chamber in the
 45 air-passage leading to the cylinder, a pump-casing opening into the mixing-chamber, a chambered plunger working within the casing and the mixing-chamber, an oil-inlet valve in
 50 the plunger, an oil-discharge port in the plunger adapted to alternately open and close by passing without and within the casing, and means to regulate the amount of oil discharged
 55 through said port.

4. A mixer or vaporizer for hydrocarbon-engines, consisting of a mixing-chamber, a pump
 adjacent thereto having a plunger working partly within the chamber, an oil-passage in
 60 the plunger having a port opening into the chamber, a sliding block in the passage to regulate the size of the port, and means to adjust the block.

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

BERNHARD SETTERGREN.

Witnesses:

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 E. M. STALEY.