

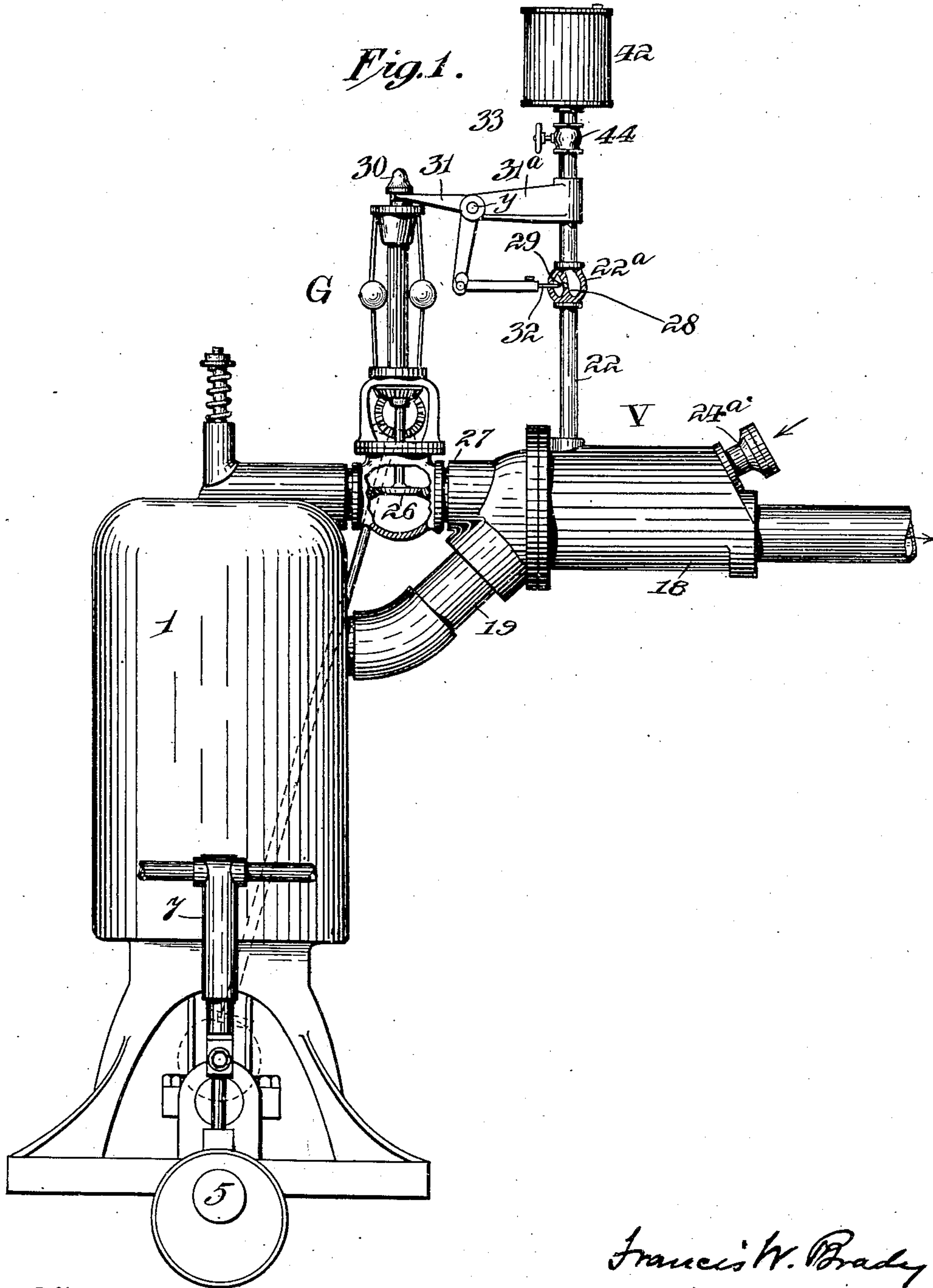
No. 835,773.

PATENTED NOV. 13, 1906.

F. W. BRADY.
INTERNAL COMBUSTION ENGINE.

APPLICATION FILED SEPT. 29, 1903.

2 SHEETS—SHEET 1.



Witnesses
E. H. Hinson
William J. Firth

Francis W. Brady
Inventor

By his Attorney *Hum. Cunniff*

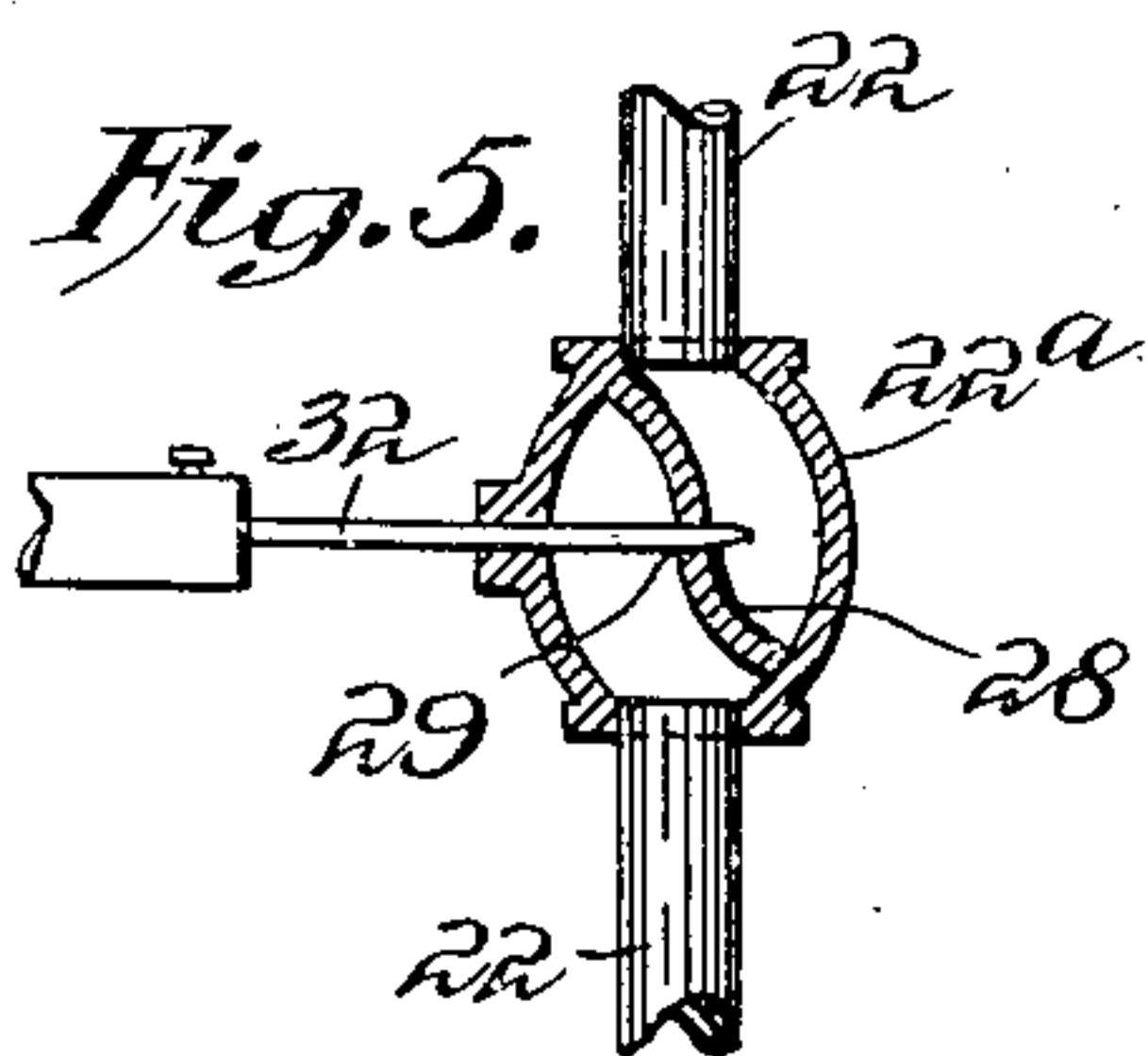
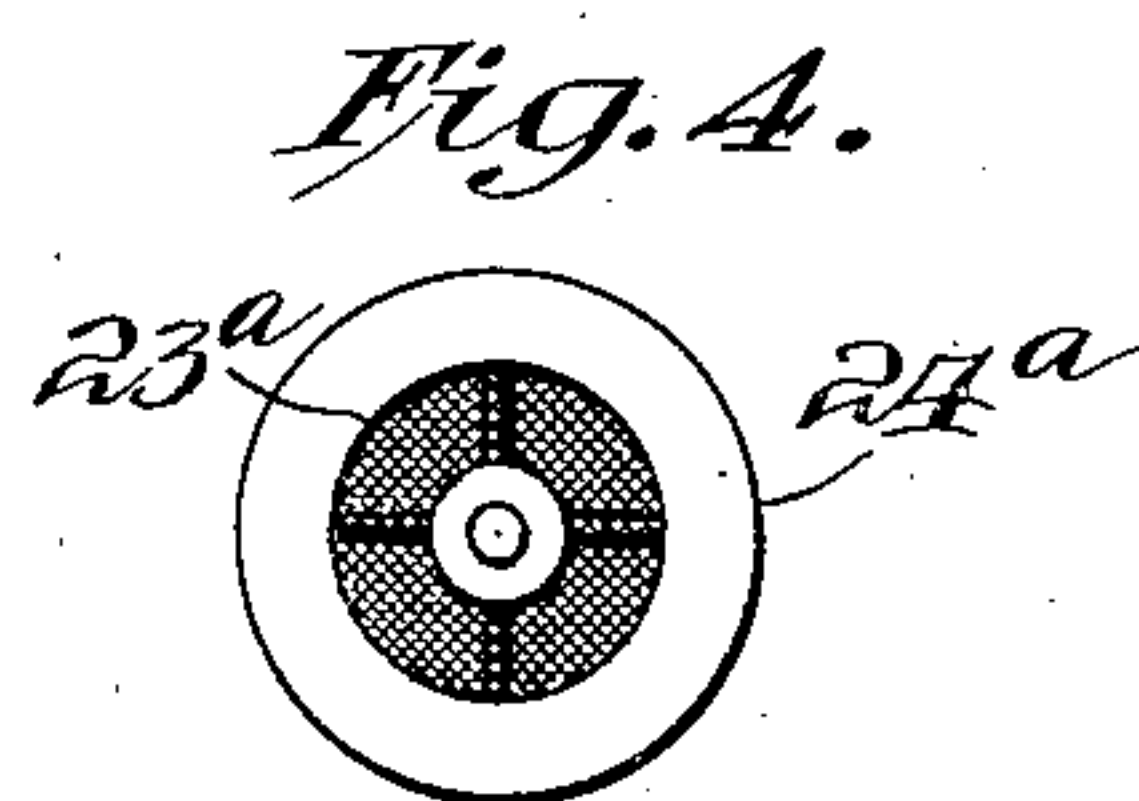
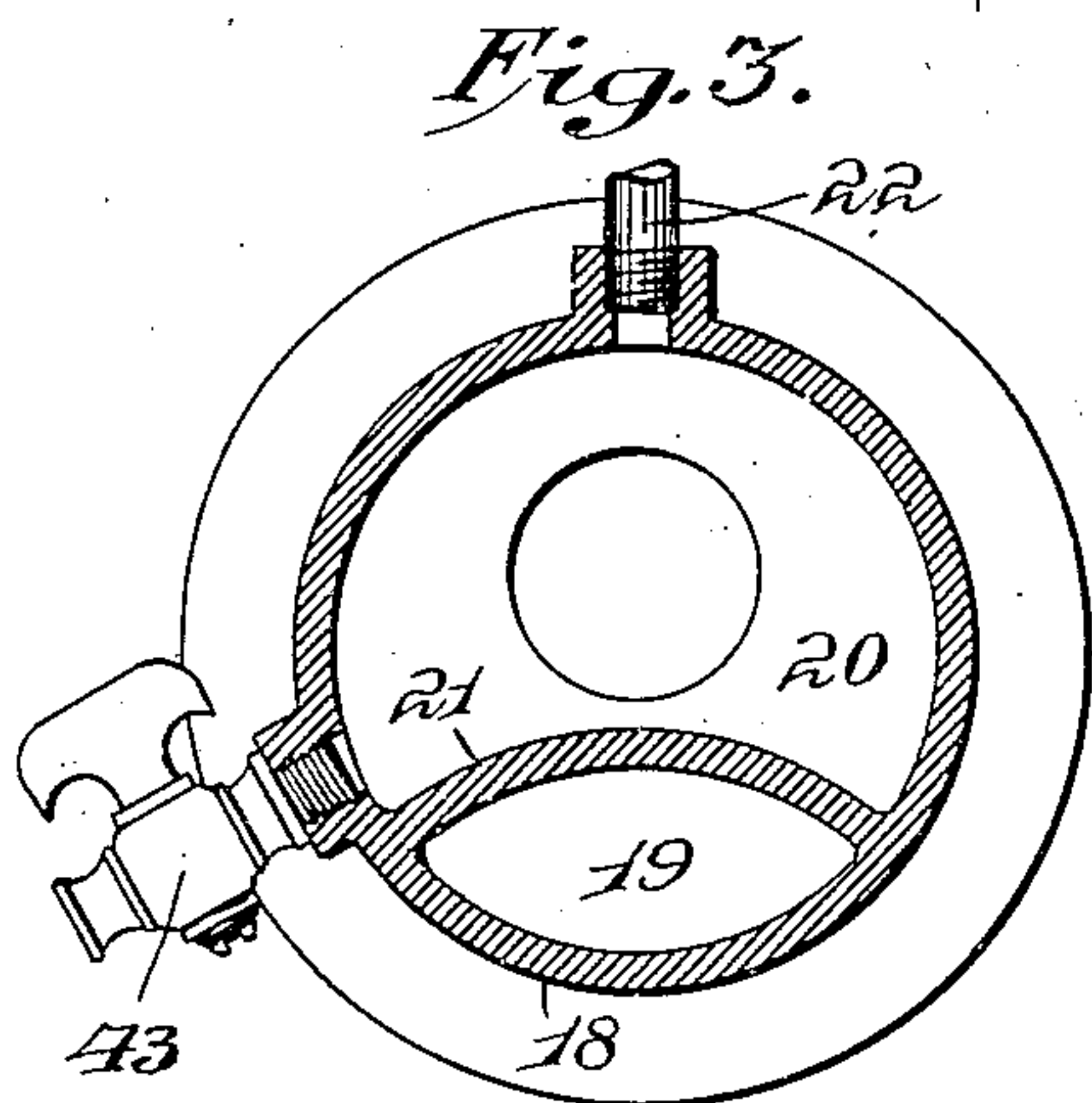
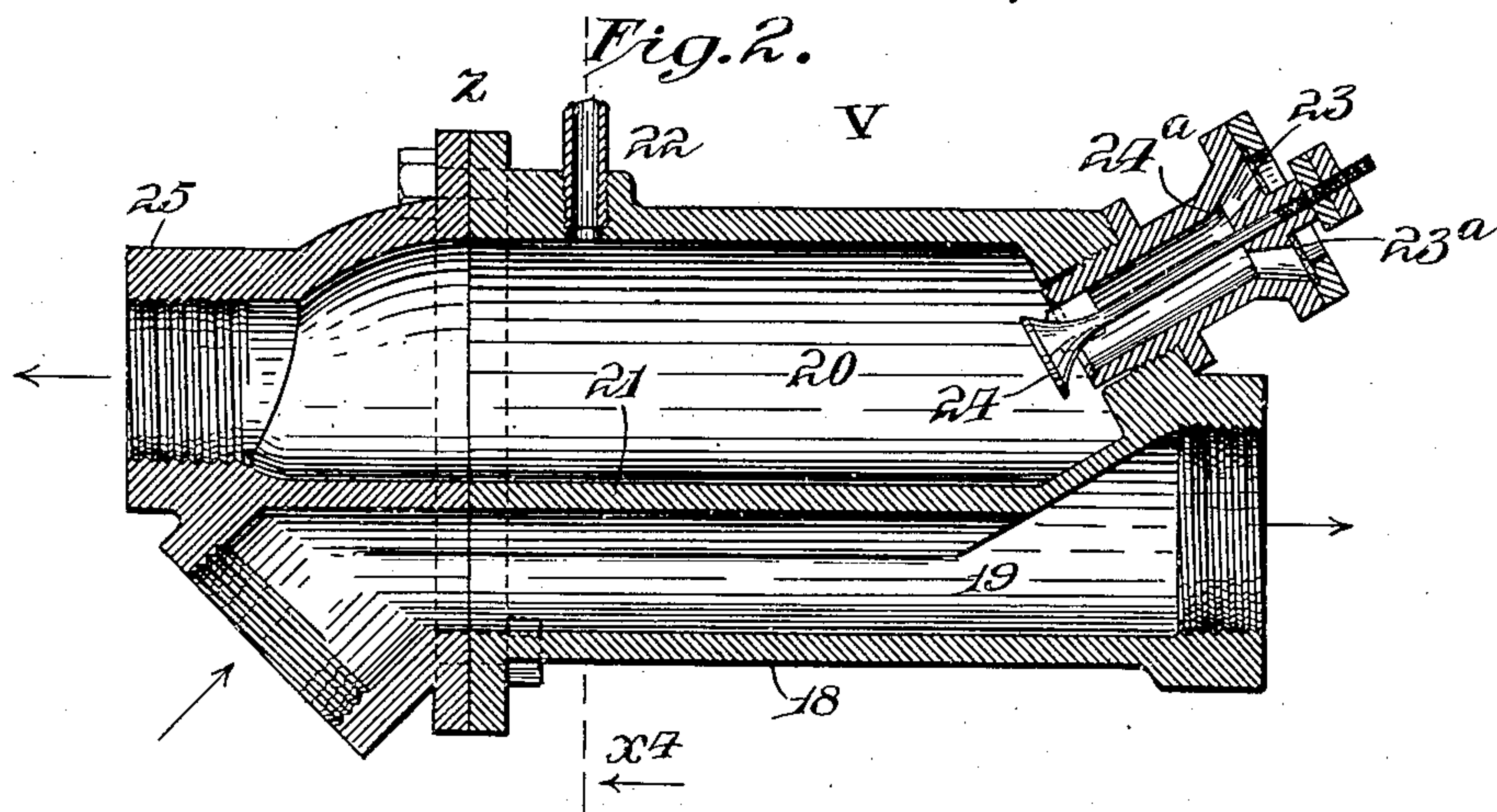
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2 SHEETS—SHEET 2.



Witnesses
F. H. Alvin
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UNITED STATES PATENT OFFICE.

FRANCIS W. BRADY, OF ENGLEWOOD, NEW JERSEY.

INTERNAL-COMBUSTION ENGINE.

No. 835,773.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed September 29, 1903. Serial No. 175,087.

To all whom it may concern:

Be it known that I, FRANCIS W. BRADY, a citizen of the United States, residing in Englewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Vaporizing Apparatus for Internal-Combustion Engines, of which the following is a specification.

My improvements relate to vaporizing apparatus for internal-combustion engines wherein a liquid hydrocarbon is vaporized for producing the hydrocarbon element of the explosive charge.

My improved vaporizer is adapted to be heated by the exhaust-gases in the engine to vaporize a heavy hydrocarbon oil and to mix with the hydrocarbon vapor so produced a certain quantity of air before it is introduced into the combustion-chamber of the engine.

My improved vaporizer is particularly adapted to be used in connection with an internal-combustion engine in which the vapor produced by the vaporizer is added to a quantity of air in the combustion-chamber of the engine to form an explosive mixture. For this purpose the air-inlet valve of the vaporizer may be set to admit a sufficient quantity of air to carry the hydrocarbon vapor, but not enough to form an explosive mixture therewith.

Referring to the drawings, Figure 1 is a side elevation of my improved vaporizing apparatus connected to an engine of my own design. Fig. 2 is an axial section of the vaporizing-chamber on a larger scale. Fig. 3 is a cross-section on the line x^x of Fig. 2. Fig. 4 is an end view of the air-inlet valve with the adjusting-nut removed, and Fig. 5 is an enlarged view of the needle-valve in the oil-supply pipe.

Referring to Fig. 1, 1 is the cylinder-casing of the engine, to which vapor is led from the vaporizer V through the inlet-pipe 27 and from which the exhaust is led through the vaporizer by the exhaust-pipe 19. Supported above the vaporizer is an oil-tank 42 which communicates with the vaporizer through the pipe 22, which contains the stop-cock 44 and the needle-valve 22^a. This pipe supports an arm 31^a, on which the lever 31 is pivoted at y . This lever carries a needle 32, which coacts with an orifice 29 in the diaphragm 28 of the needle-valve 22^a to regulate the flow of the oil from the tank 42 to the vaporizer. The lever 31 engages with a

cap 30 on the governor G. This governor is also connected to the valve 26 in the vapor-feed pipe 27.

Referring to Figs. 2, 3, and 4, it will be seen that the vaporizing-chamber is made in two sections bolted together at z . The vaporizer is divided into two chambers by the curved partition 21, which forms the bottom of the chamber 20 into which the oil to be vaporized is fed through the pipe 22 and also the top of that portion of the exhaust-pipe 19 which is included in the vaporizer-casing 18. The chamber 20 is provided with an outlet-passage 25, to which the vapor-feed pipe 27 is attached, and at the other end with an air-inlet passage 23, controlled by a valve 24, supported in a casing 24^a. The stem of the valve is screw-threaded and provided with a nut, so that the extent of the opening of the valve can be adjusted. The chamber 20 should be provided with a drainage-cock 43, as shown in Fig. 3.

The operation will be readily understood. The exhaust-gases from the engine heat the plate 21, which vaporizes the oil dropping upon it from the pipe 22. The vapor so produced is mixed with air entering through the passage 23 and is drawn into the combustion-chamber of the engine through the outlet 25 and the pipe 27. As the speed of the engine increases the governor decreases the extent of the opening of the needle-valve 22^a and the vapor-valve 26, thus simultaneously regulating the amount of vapor drawn from the vaporizer and the amount of oil fed to the vaporizer. By this means the accumulation of the hydrocarbon vapor in the vaporizer as the amount of the vapor feed decreases is prevented and the character of the mixture is maintained substantially the same at all times.

The casing 24^a supports a screen 23^a in the air-passage 23 to prevent the admission of foreign particles in the atmosphere.

What I claim is—

1. An internal-combustion engine having a vaporizer comprising a vaporizing-chamber provided with a curved spraying-surface, a hot-fluid passage formed in part by the partition bearing said surface, a valve for the admission of air at one side of said chamber and an outlet on the other end connecting with the explosion-chamber of the engine, a fuel-tank connected with said vaporizer, a regulating-valve for varying the amount of fuel fed to the vaporizer, a second

regulating-valve between the engine and vaporizer for varying the amount of vapor fed to the engine, a centrifugal governor geared to the main shaft of the engine, and
 5 means connecting said governor with both of said valves, whereby a variation of the speed of the engine varies proportionally the amount of vapor fed to the engine and of fuel
 10 fed to the vaporizer, substantially as described.

2. An internal-combustion engine having a vaporizer adapted to supply air saturated with vaporized fuel, said vaporizer comprising a vaporizing-chamber provided with a
 15 spraying-surface, a regulable valve for the admission of air at one side of said chamber and an outlet at the other end connecting with the explosion-chamber of the engine, a fuel-tank connected with said vaporizer, a
 20 regulating-valve for varying the amount of fuel fed to the vaporizer, a second regulating-valve between the engine and vaporizer for varying the amount of vapor fed to the engine, a governor geared to the main shaft
 25 of the engine and means connecting said governor with both of said valves, whereby a variation of the speed of the engine varies proportionally the amount of vapor fed to the engine and of fuel fed to the vaporizer,
 30 substantially as described.

3. A vaporizer, having a casing, a curved partition therein engaging with the ends and sides of the casing and dividing the vaporizer
 35 into two chambers, means for spraying fuel upon one side of said partition, means for conducting air through the chamber into which the fuel enters, and means for conducting a heating fluid through the other of said chambers.

40 4. A vaporizer having a casing, a curved partition therein engaging with the ends and sides of the casing and dividing the vaporizer

into two chambers, means for spraying fuel upon the convex side of said partition, means
 45 for conducting air through the chamber into which the fuel enters, and means for conducting a heating fluid through the other of said chambers.

5. A vaporizer, having a cylindrical casing, a longitudinally-extending and laterally-
 50 curved partition therein which engages with the ends and sides of the casing and means for spraying fuel upon one side of said partition, means for conducting air through the chamber into which the fuel enters, and
 55 means for conducting a heating fluid through the other of said chambers.

6. A vaporizer having a cylindrical casing, a longitudinally-extending and laterally-
 60 curved partition therein which engages with the ends and sides of the casing and divides the vaporizer into two chambers, means for spraying fuel upon the convex side of said partition, means for conducting air through
 65 the chamber into which the fuel enters and means for conducting a heating fluid through the other of said chambers.

7. A vaporizer having a casing, a partition therein engaging with the ends and sides
 70 of the casing and dividing the vaporizer into two chambers, means for supplying fuel to one of said chambers, means for conducting air through the chamber to which the fuel is supplied, means for conducting a heating
 75 fluid through the other of said chambers and an adjustable valve controlling the flow of air through the fuel-chamber.

In witness whereof I have hereunto signed my name, this 23d day of September, 1903, in the presence of two subscribing witnesses.
 80 FRANCIS W. BRADY.

Witnesses:

CHAS. D. STANTON,
 HEZEKIAH BUTWHISTLE.