

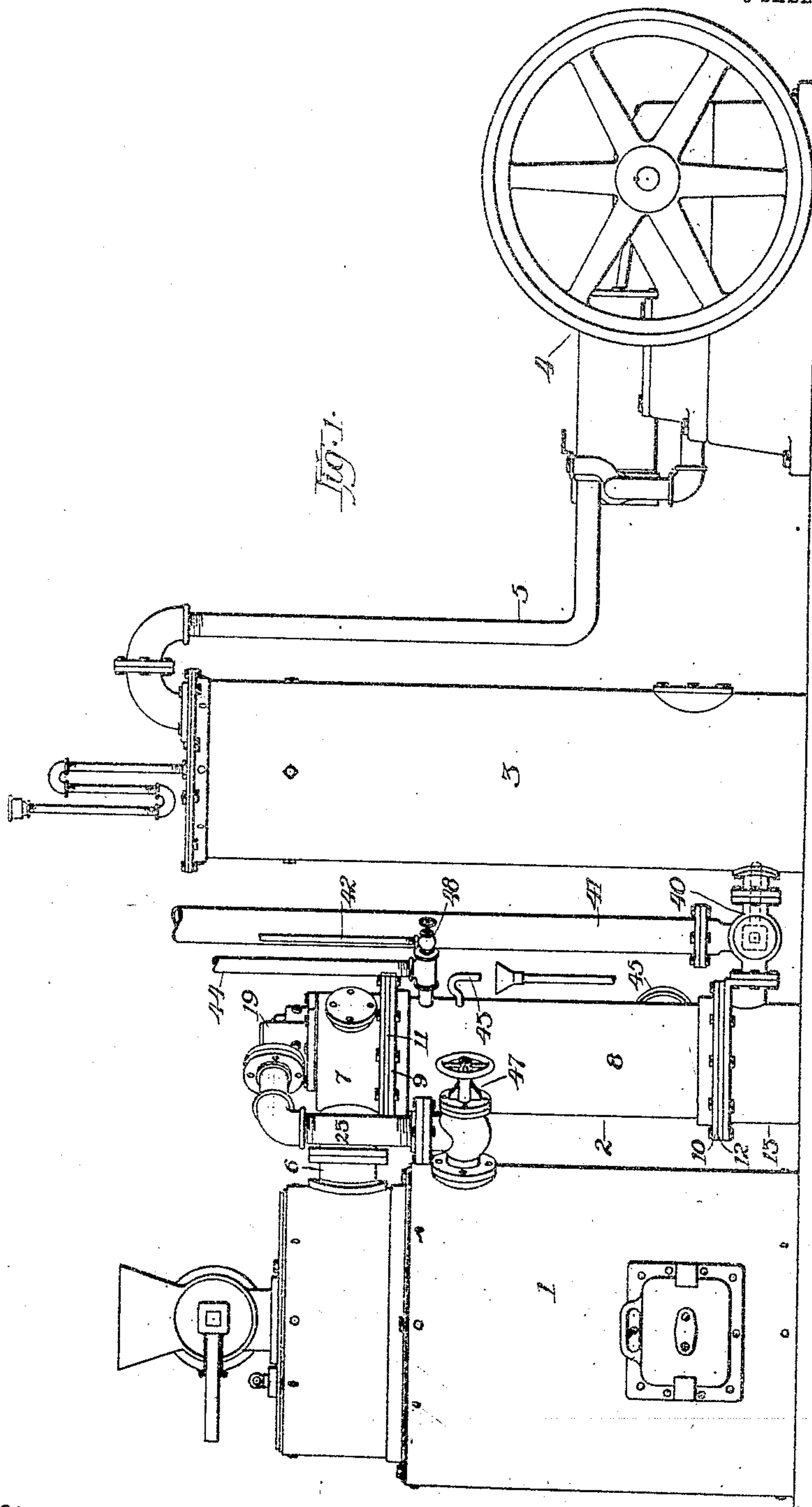
No. 835,626.

PATENTED NOV. 13, 1906.

A. M. LEVIN.
GAS PRODUCER.

APPLICATION FILED MAY 26, 1906.

3 SHEETS—SHEET 1.



Witnesses:
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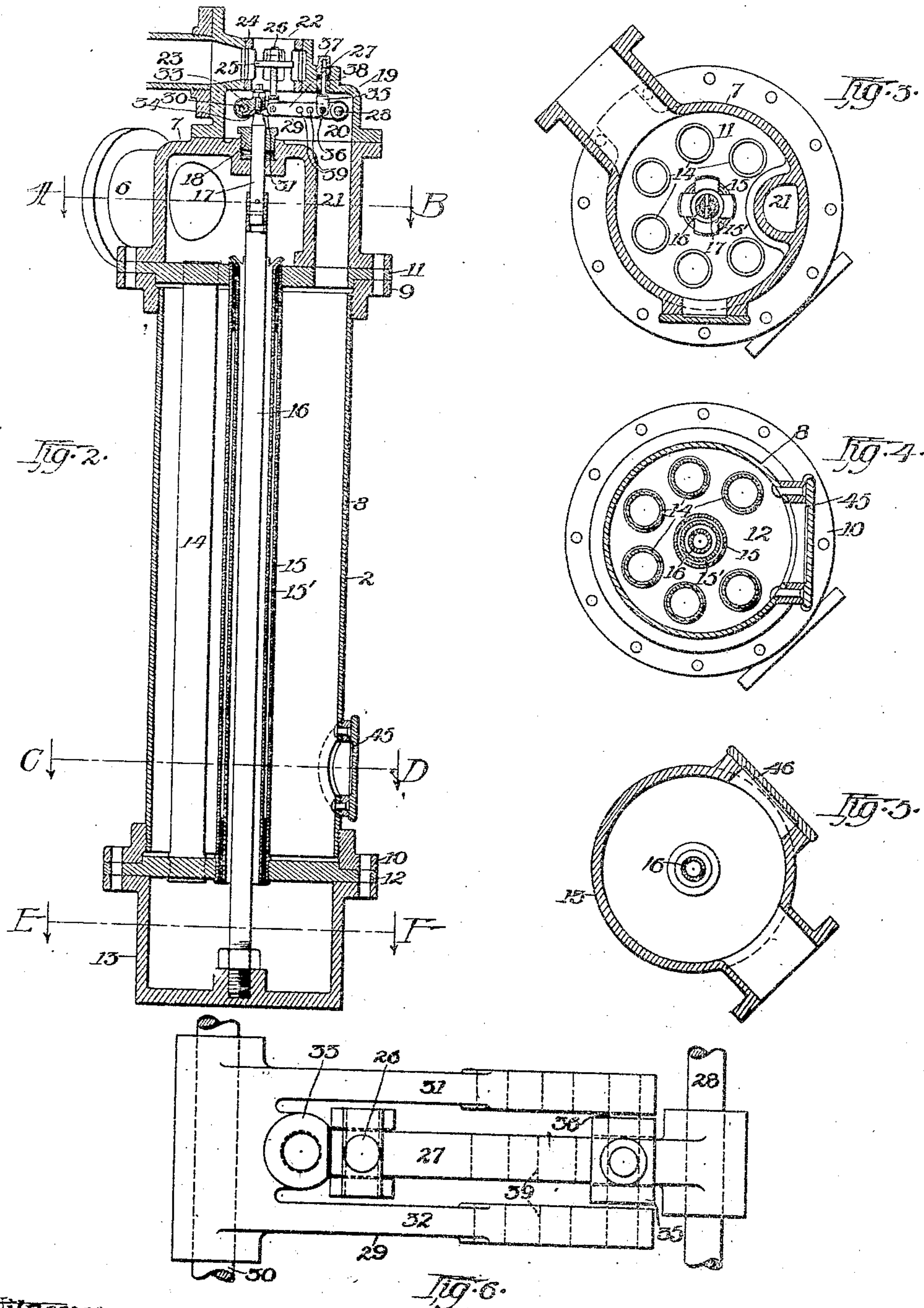
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3 SHEETS—SHEET 2.



Witnesses.

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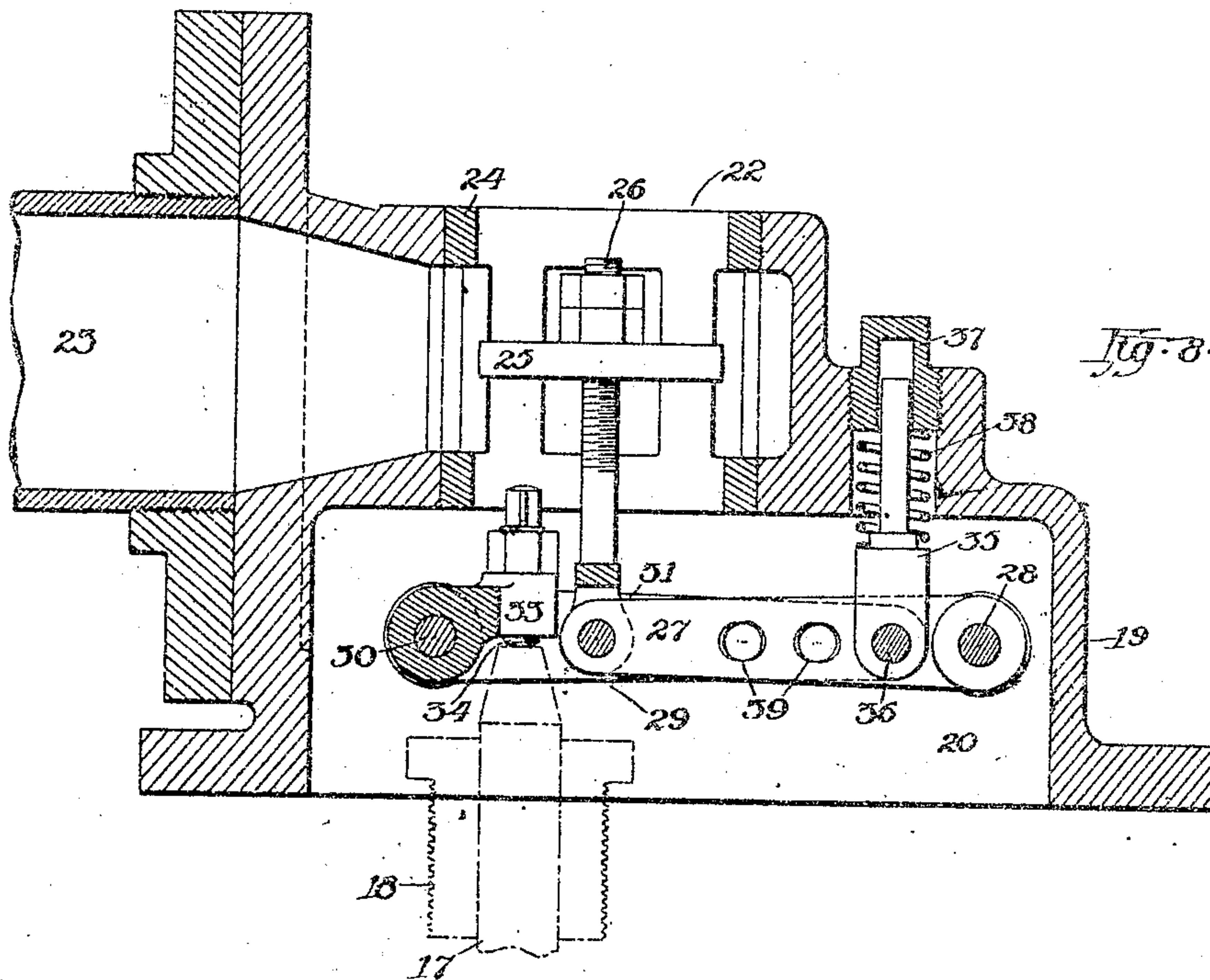
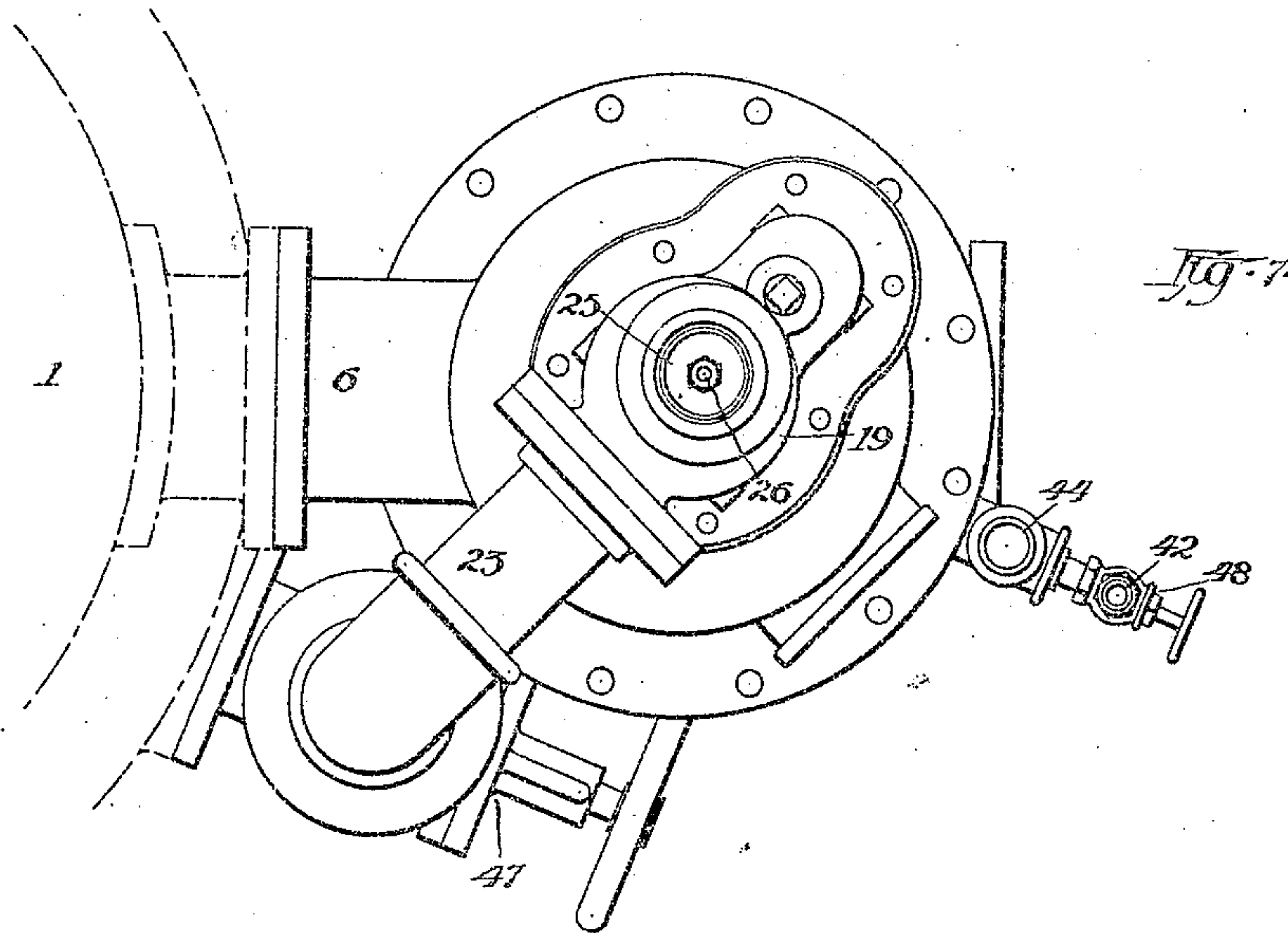
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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GAS-PRODUCER.

No. 835,626.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed May 26, 1906. Serial No. 818,858.

To all whom it may concern:

Be it known that I, ARVID M. LEVIN, 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 Gas-Producers, of which the following is a specification.

My invention relates to gas-producers, and particularly to that type of such machines commonly called "suction - producers," wherein a flow of gas from the producer and a flow of air and air and moisture thereto is induced by the suction action of an explosive-engine connected therewith in drawing in its charge.

In the successful and economical operation of this class of machines it is important that the flow of air and air and moisture to the producer for the purpose of aiding combustion of the fuel and enriching the gas be properly proportioned in order to prevent a too high degree of heat and consequent incandescence of the fuel.

The object of my invention is to provide means whereby the proportion of air and air and moisture flowing into the producer will be governed by the degree of heat of the outflowing gases by means of a thermostat located in the path of the outflow of gas from the producer and receiving heat therefrom, said thermostat being connected with a valve mechanism adapted to control the admission of air and of air and moisture to the producer.

An embodiment of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a gas-producer and engine attached. Fig. 2 is a sectional elevation of a vaporizer connected with the gas-conduit leading from the producer and in which is mounted a thermostat adapted to control the air and air and moisture admitted to the producer. Fig. 3 is a cross-section of Fig. 2 on line A B. Fig. 4 is a cross-section of Fig. 2 on line C D. Fig. 5 is a cross-section of Fig. 2 on line E F. Fig. 6 is a plan view of the lever connections between the air and air and moisture governing valve and the operative end of the thermostat. Fig. 7 is a plan view of the upper end of the vaporizer on an enlarged scale; and Fig. 8 is a sectional elevation of a part of the upper portion of Fig. 2, on an enlarged scale, showing the manner of connecting the thermostat with the air and air and moisture controlling valve.

Like reference-numerals designate the same parts throughout the several views.

1 represents a producer, which may be of any desired form.

2 is a vaporizer connected with the producer.

3 is a scrubber, and 4 represents an explosive-engine, receiving gas from the scrubber by means of a pipe connection 5.

6 represents a gas-conduit leading from the upper part of the producer to an inclosed chamber 7, secured to the upper end of the vaporizer 2.

The vaporizer comprises in its preferred form a cylindrical shell portion 8, having flanges 9 and 10 secured to its upper and lower ends, respectively, and 11 and 12 represent upper and bottom plates, the plate 11 being interposed between the lower end of the chamber 7 and the flange 9 and the plate 12 between the flange 10 and a chamber 13, secured to the lower end of the vaporizer. The upper and lower chambers 7 and 13 communicate with each other by means of a series of tubes 14, having their opposite ends secured in openings in the plates and arranged concentrically with the longitudinal axis of the cylindrical shell.

15 represents a tube axially arranged in the cylindrical shell and surrounding an inner tube 15', leaving an intervening space between them for the reception of a non-conductor of heat, such as asbestos paper.

16 represents a thermostat comprising a brass tube having its lower end secured to the bottom of the chamber 13 and extending upward within the inner tube 15' and provided at its upper end with a gudgeon 17, secured thereto and slidably mounted in a bearing-block 18, adjustably mounted in the upper wall of the chamber 7. Secured to the upper part of the chamber 7 is a head portion 19, having a lower annular chamber 20, communicating with the vaporizer by means of a vertical conduit 21 at one side of the chamber 7.

22 represents a mixing-chamber formed in the head portion 19, and communicating therewith is a pipe 23, leading to the producer, and 24 is a cylindrical shell, secured at its opposite ends in openings in the upper and lower walls of the mixing-chamber 22 and having a series of longitudinally-arranged ports opening into said chamber.

25 represents a piston-valve mounted in

the shell 24 and having a stem 26 secured thereto, the lower end of the stem being pivotally connected with one end of a lever 27, having its opposite end pivotally connected with the wall of the chamber 20 by means of a pin 28.

29 represents a lever having one end pivotally connected with the wall of the chamber upon the opposite side of the valve-stem 26 by means of a pin 30 and comprising two arms 31 and 32, arranged upon opposite sides of the lever 27 and extending parallel therewith, and a central ear portion 33, provided with an adjustable screw-threaded pin 34, having its lower end arranged to contact with the upper end of the gudgeon 17.

35 is a spring-pressed plunger having its lower end provided with a slotted head-piece that is pivotally connected with the lever 27 and the arms 31 and 32 of the lever 29 by means of the pin 36 and having an upper stem portion slidably mounted in an adjustable bearing-block 37, mounted in the upper wall of the chamber 20 and having a coiled spring 38 surrounding the stem and operative between the lower end of the bearing-block and the enlarged lower end of the plunger in a manner to yieldingly hold the screw-pin 34 in contact with the thermostat.

The arms 31 and 32 and the lever 27 are provided with a series of lateral openings 39, through which the pin 36 may be passed for the purpose of adjusting the movement of the valve as controlled by the thermostat. When the pin 36 is removed from its connection with the plunger 35 and placed in either of the openings 39 for the purpose of adjusting the throw of the valve, a shorter pin is used to connect the plunger with the lever 27.

A pipe 40 connects the chamber 13 with the scrubber 3, and 41 represents the usual relief-pipe connected therewith. Water is supplied to the vaporizer by means of a pipe 42, connected with a source of supply, and 43 represents a drip or overflow pipe leading from the vaporizer, and 44 is an air-supply pipe communicating with the vaporizer. 45 is a hand-hole through the shell of the vaporizer at its lower end for the convenience of the operator in cleaning the chamber, and 46 represents a similar opening in the wall of chamber 13. 47 represents a valve controlling the supply of air and air and moisture to the producer, and 48 is a valve controlling the supply of water to the vaporizer.

When the engine is running steadily with a uniform load, little or no change is required in the volume or proportions of the mixture of air and moisture, as the gas drawn from the producer is practically uniform in temperature; but if the load upon the engine increases a larger volume of gas is required, and consequently a greater draft is created in the producer, increasing the degree of incandescence of the burning coal, and conse-

quently the degree of heat of the gas delivered from the producer and flowing through the chamber 7 and the tubes 14 and 15 into chamber 13 and thence to the scrubber.

The hot gases flowing through the tubes 14 raise the temperature of the water in the vaporizer, and steam is mixed with the air drawn therein through the air-pipe connection. The air and moisture are drawn through the conduit 21 and through the openings in the shell 24 to the mixing-chamber 22, where it becomes mixed with air drawn into the chamber through the upper end of the shell, and the pipe 23 conducts the mixture to the producer. As the temperature of the gases drawn downward through the tube 15 is increased or diminished the thermostat 16 expands or contracts in length, and through its connection with the valve 25 raises or lowers it in the shell 24 in a manner to regulate the supply of air or of air and moisture drawn through the pipe 23, the sensitiveness of the movement of the valve as controlled by the thermostat being regulated by means of the adjustable connection between the lever 27 and the arms 31 and 32 of the lever 29.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A gas-producer comprising, in combination, a producer, a vaporizer having an outlet communicating with said producer, an inlet for air communicating with said producer, a valve controlling said air-inlet and the outlet from said vaporizer, and a thermostat operative to control the movement of said valve.

2. A gas-producer comprising, in combination, a producer, a vaporizer having an outlet communicating with said producer, an inlet for air communicating with said producer, a valve mechanism controlling said inlet for air and the outlet from said vaporizer, and a thermostat operative to control said valve mechanism.

3. A gas-producer comprising, in combination, a producer, a gas-conduit leading from said producer, a vaporizer adapted to receive heat from said gas-conduit and having an outlet communicating with said producer, an inlet for air communicating with said producer, a valve controlling said air-inlet and the outlet from said vaporizer, a thermostat mounted within said gas-conduit, said thermostat being operative to control the movement of said valve.

4. A gas-producer comprising, in combination, a producer, a vaporizer having an outlet communicating with said producer, an inlet for air communicating with said producer, a valve controlling said air-inlet and the outlet from said vaporizer, a thermostat, and a lever connection between said valve and said thermostat.

5. A gas-producer comprising, in combina-

tion, a producer, a vaporizer having an outlet communicating with said producer, an inlet for air communicating with said producer, a valve controlling said air-inlet and the outlet from said vaporizer, a thermostat, a lever connection between said thermostat and said valve, and means for regulating said lever connection in a manner to control the extent of movement of said valve.

6. A gas-producer comprising, in combination, a producer, a vaporizer communicating with said producer, said vaporizer comprising a body portion having head and bottom plates secured thereto, said plates being connected by means of a series of tubes, upper and lower chambers communicating with said tubes, a gas-conduit connecting said upper chamber with said producer, a mixing-chamber, a vapor-conduit having ports connecting said mixing-chamber with said vaporizer, a pipe connection between said mixing-chamber and said producer, an air-inlet having ports communicating with said mixing-chamber, a valve mechanism controlling said ports, a thermostat mounted in one of said tubes and connected with said valve mechanism.

7. A gas-producer comprising, in combination, a producer, a vaporizer communicating with said producer, said vaporizer comprising a body portion having head and bottom plates secured thereto, said plates being connected by means of a series of tubes, upper and lower chambers communicating with said tubes, a gas-conduit connecting said upper chamber with said producer, a mixing-

chamber, a pipe connection between said mixing-chamber and said producer, said mixing-chamber having one or more ports communicating with the atmosphere and with said vaporizer, a valve adapted to control said ports in a manner to regulate the proportions of air and vapor, a thermostat mounted in one of said tubes, and a lever mechanism connecting said thermostat with said valve.

8. A gas-producer comprising, in combination, a producer, a vaporizer communicating with said producer, said vaporizer comprising a body portion having head and bottom plates secured thereto, said plates being connected by means of a series of tubes, upper and lower chambers communicating with said tubes, a gas-conduit connecting said upper chamber with said producer, a mixing-chamber, a pipe connection between said mixing-chamber and said producer, said mixing-chamber having one or more ports communicating with the atmosphere and with said vaporizer, a valve adapted to control said ports in a manner to regulate the proportions of air and vapor, a thermostat mounted in one of said tubes, a compound-lever mechanism connecting said thermostat with said valve, and means for regulating said compound-lever mechanism in a manner to control the extent of movement of said valve.

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Witnesses:

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