(No Model.) 2 Sheets—Sheet 1.

J. A. MARSH.

VAPOR BURNER AND STOVE.

No. 413,828. Patented Oct. 29, 1889.

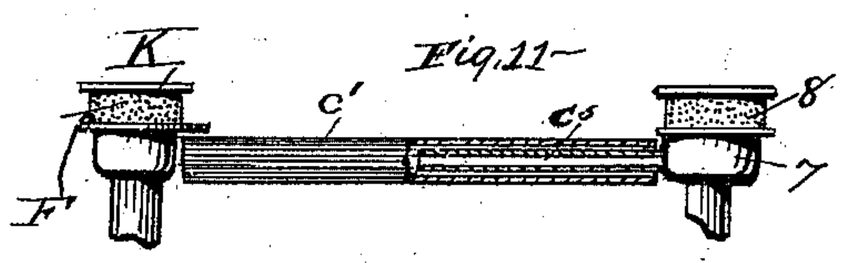


Fig. 11.

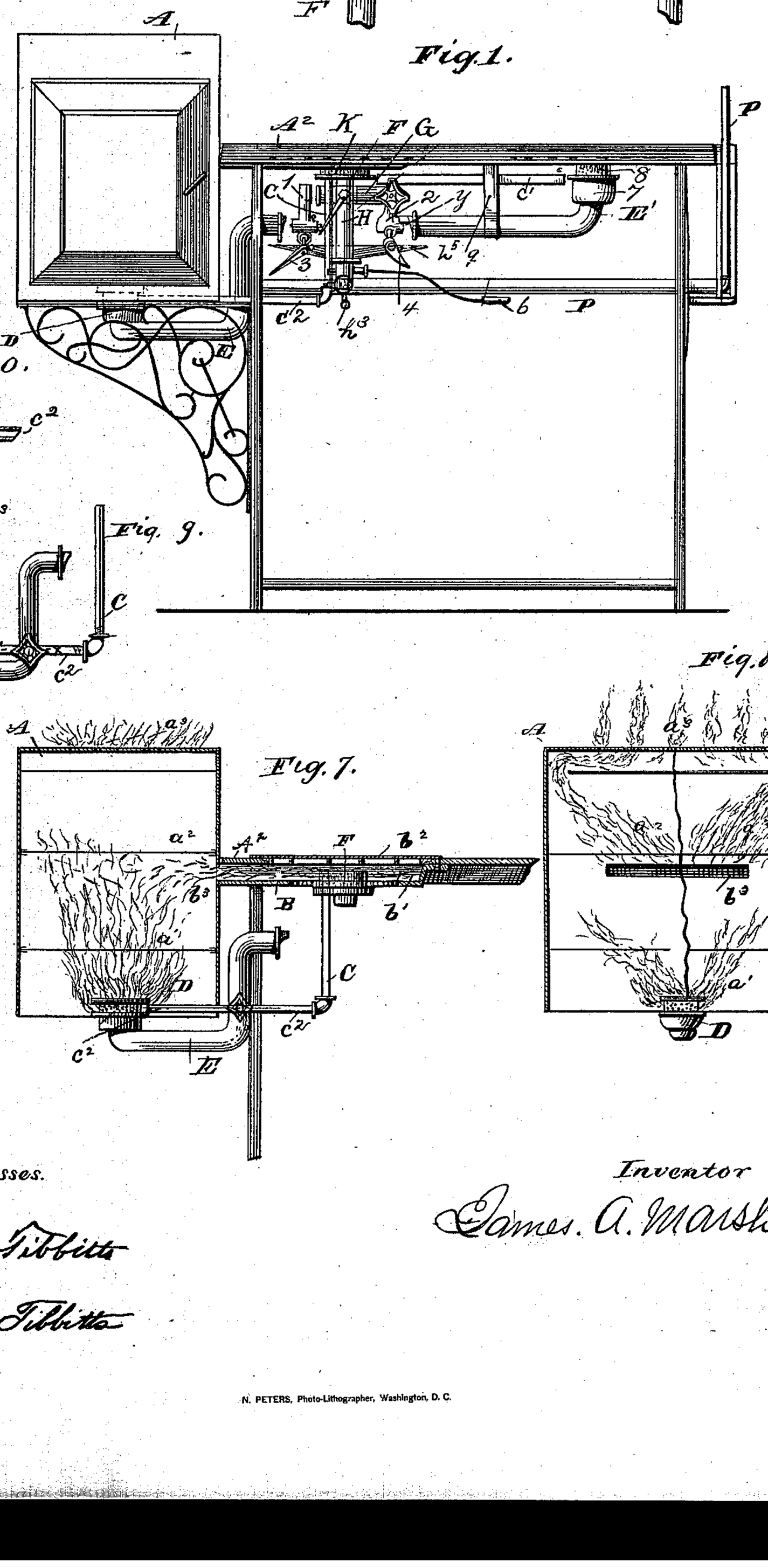
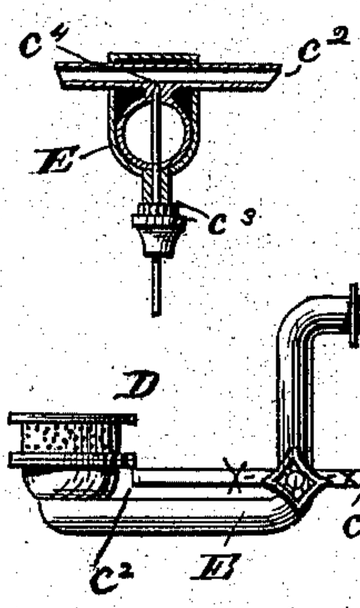


Fig. 1.

Fig. 10.



Witnesses.

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Inventor

James. A. Marsh.

(No Model.) 2 Sheets—Sheet 2.

J. A. MARSH.

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Fig. 5.

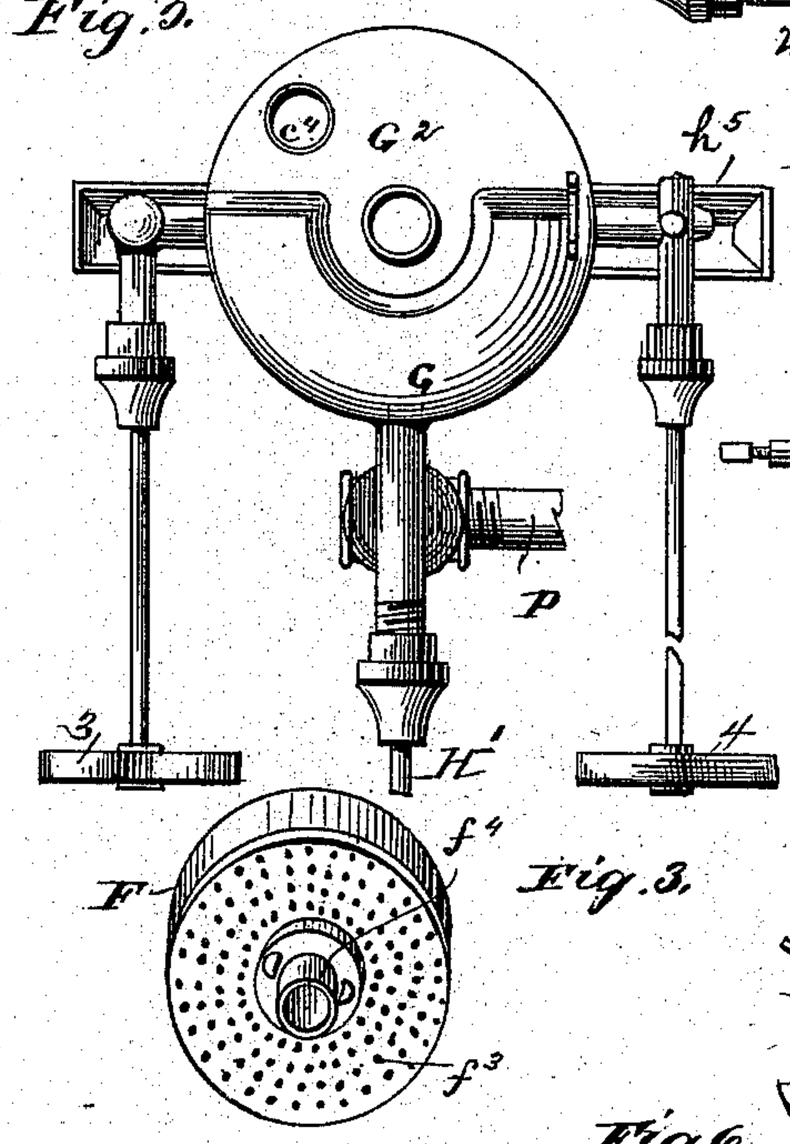


Fig. 3.

Fig. 4.

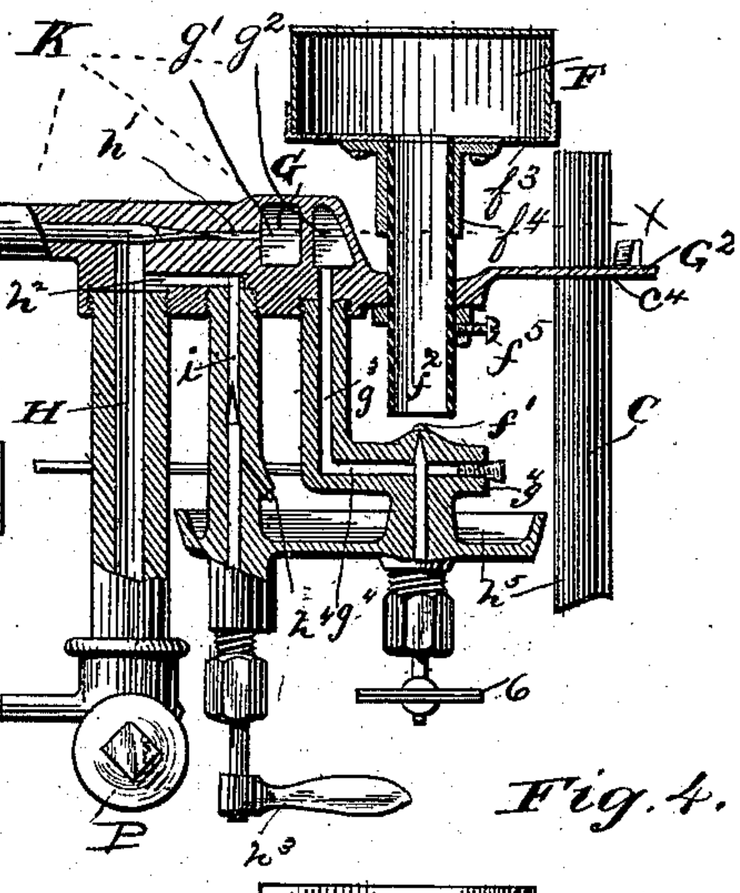
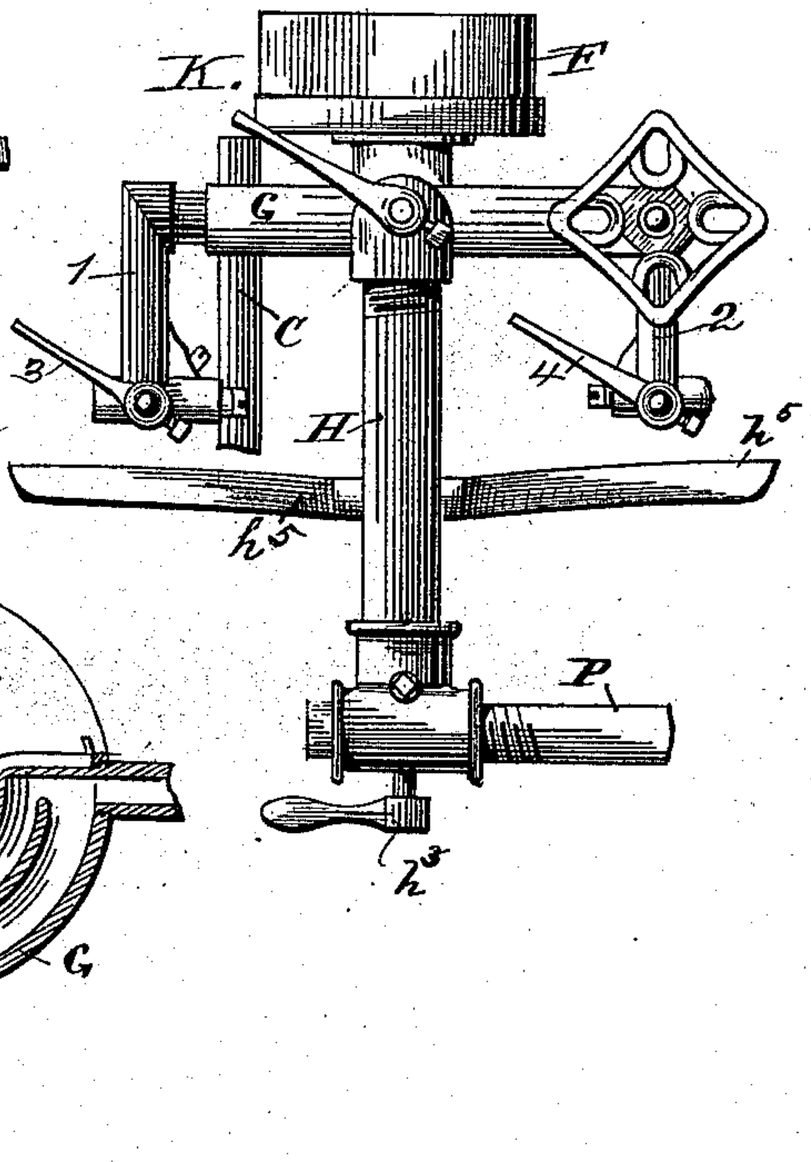
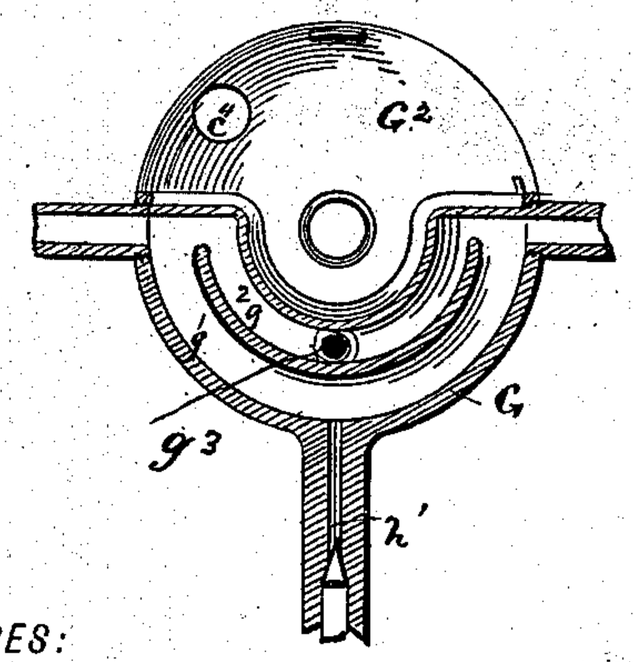


Fig. 6.





WITNESSES:

Geo. W. Gibbitts.

Geo. B. Gibbitts

INVENTOR

James. A. Marsh.

UNITED STATES PATENT OFFICE.

JAMES A. MARSH, OF CLEVELAND, OHIO.

VAPOR BURNER AND STOVE.

SPECIFICATION forming part of Letters Patent No. 413,828, dated October 29, 1889.

Application filed January 28, 1887. Serial No. 225,822. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. MARSH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vapor Burners and Stoves, of which the following is a description.

My invention relates to vapor burners and stoves; and it consists of the improvements hereinafter described and claimed.

My improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a side view in elevation; Fig. 2, a cross-section, partly in elevation, and showing a modification of the burner-cap; Fig. 3, a perspective view of the modified burner-cap; Fig. 4, a front elevation of the central burner; Fig. 5, a plan view of same with burner-cap removed; Fig. 6, a horizontal section on line $x\,x$ of Fig. 2; Fig. 7, a sectional view of an oven and connections with my burner attached; Fig. 8, a transverse section of same, showing opening in the side for heat; and Figs. 9, 10, and 11, detail views of modifications of lighting-tube as shown in Fig. 1.

Referring to the drawings, A is an oven attached to one side of a gasoline-stove to be heated by a burner D.

K is a burner composed of the retort or vaporizing-chamber G and burner-chamber F.

The burners D and 8 are non-generating burners.

P is a pipe for supplying gasoline from any suitable reservoir to the vaporizing-chamber G through stand-pipe H.

E E′ are pipes for supplying, through intermediate pipes 1 and 2, the burners D and 8 with the generated vapor from the chamber G. Ignited gas may also be carried from burner D to burner K, or vice versa, through pipes C C^2; and E′ is a valve in pipe E for controlling said supply.

3 is a valve controlling the gas in pipe 1, leading to the burner D, and 4 is a valve controlling the gas in pipe 2, leading to burner 8. At the point y, where the valve 4 is located, the pipe E′ receives its supply of vapor from generator G.

The generating-chamber G is composed of two compartments g' g^2, and is connected with supply-pipe H as follows: h' is a duct leading from the top of pipe H and at right angles therewith to compartment g', and is controlled by valve H′. h^2 is a duct leading off from pipe H in the same direction as h', but below it, and connects with duct i, which leads down to channel h^4, leading into a drip-cup h^5. The duct i and channel h^4 are controlled by valve h^3. Connecting with compartment g^2 is a duct g^3, leading down into cross-pipe g^4, which connects with a needle-jet orifice f' in pipe g^4, which extends up and crosses duct g^3 at right angles therewith and is controlled by valve 6.

The burner-chamber F is provided with a perforated bottom f^3 and with a downwardly-projecting tube f^4. Into f^4 is pushed an induction-tube f^2, which, communicating at its upper end with the chamber F, terminates at its lower end over needle-orifice f'. The burner-chamber F is held in its position by the tube f^2, which in turn is supported by disk G^2. G^2 projects out from and is a part of the generating-chamber G, and through which tube f^2 extends. The tube f^2 is secured tightly to a downwardly-projecting part of G^2 by means of a set-screw f^5.

C is a pipe provided with a branch C^2, terminating at one end in proximity to burner-chamber F and at the other end in proximity to burner D, for the purpose of conducting ignited gas from said chamber to the said burner. The pipe C on its way to chamber F passes through opening c^4 in disk G^2. C′ is a similar pipe for conducting ignited gas from burner K to burner 8, and 9 is a hanger for supporting pipe C′.

In Fig. 10, at the point where the pipe c^2 crosses the large induction or vapor tube E, a valve is placed controlling a duct c^4, leading from tube E into lighting-tube c^2 for controlling the inlet of gas from tube E into tube c^2, whereby gas may be thrown both ways through tube c^2 for automatically lighting either burner D or K.

As shown in Fig. 11, c^5 is a small pipe entering commingling-chamber 7 of burner 8 and extending into and to near the center of the tube C′ for the purpose of facilitating the action of automatic lighting of burner 8 by burner K by projecting a small portion of unlighted gas from the commingling-chamber

of burner K against the flame in the lighting-tube. In order that flame ignited at the end of pipe c^5 shall not flash back into commingling-chamber 7, the hole through said pipe should be exceedingly small—not larger than one-sixteenth of an inch in diameter, and preferably smaller. I have found that with such a small pipe the flame will not flash back.

The oven A may be of any of the well-known forms of oil, gas, or gasoline ovens, and can be placed at either end or at the back of the stove.

A^2 is the top of the stove, and beneath this top I place a bottom plate B, which surrounds the burner K and forms a flue b'. A corresponding opening b^3 is formed in the side of the oven. When a solid lid b^2 or a large vessel is placed over the burner, the heat from burner K may not only be utilized for cooking, but also be used to furnish additional heat to heat the oven. Currents of heat a' and a^2 from burner D and from burner K will then ascend through the oven-top a^3.

The operation of the stove is as follows: For initial starting, fluid being admitted to pipe P flows through stand-pipe H to duct h^2, (the duct h', leading to vaporizing-chamber G, being closed by valve H',) thence down pipe i and through channel h^4 into drip-cup h^5. After the drip-cup is provided with a sufficient quantity for igniting, the supply thereto is cut off by turning valve h^3, and the vapor in the drip-cup is ignited. The generating-chamber G is then heated to a vaporizing condition. Valve H' is then opened, which lets the gasoline in from pipe H to duct h', and thence it passes, first, into compartment g', thence into g^2. There vaporized, it passes down duct g^3, and, valve 6 being opened, it is let through needle-orifice f' into burner-tube f^2, and thence into burner-chamber F, where it is ignited. After the vapor is generated in chamber G it is distributed to non-generating burners D and 8 through the pipes E and E', respectively, as already described. Ignited gas is distributed to burners D and 8 from burner K by means of pipes C, C^2, and C', as also previously described.

It will be noticed that by my arrangement of parts the flames from the burner-chamber F are all projected down through its perforated bottom onto the generating-chamber G and that the latter is so constructed with its compartments g' g^2 that the fluid is compelled to pass beneath the flames of the burner-chamber twice before reaching the downward duct g^3, thus utilizing to the best advantage the heat from the burner-chamber to maintain the vaporization in chamber G. It will also be noticed that by reason of the independent ducts to the generating-chamber and to the drip-cup, controlled by independent valves, the act of supplying the drip-cup does not necessitate the opening or closing of the separate burners, and that all the burners may be controlled in their supply of gas or generated vapor by one valve, so that when one burner is extinguished all may be extinguished.

By my construction and arrangement of parts burners located at different elevations on horizontal and perpendicular pipes can be lighted at one operation—a very important and material feature of my invention, as it has generally been regarded as impracticable to carry the ignited gas through pipes turned at an angle to each other and to burners at different heights. Further, the operation of the igniting-tube leading to such burners is greatly facilitated by the employment of the small tube to project vapor into the midst of the lighting-tube, as it replenishes the flame at that point, which otherwise might be weakened by the long and tortuous course it would be subjected to in long connected horizontal and perpendicular pipes.

What I claim is—

1. In a vapor-stove, in combination with two or more burners, one of said burners being provided with a commingling-chamber, a pipe for carrying ignited gas from one burner to the other, and a pipe c^5, leading from said commingling-chamber into said gas-pipe for carrying into the latter unignited gas, as and for the purpose described.

2. In a vapor-stove, in combination with two burners, an induction or vapor tube for carrying the vapor from one burner to the other, a tube for carrying ignited gas from one of said burners to the other, a duct leading from said vapor-tube into said lighting-tube, and a valve controlling said duct, whereby gas may be thrown to both burners, substantially as described.

JAMES A. MARSH.

Witnesses:
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GEO. W. TIBBITTS.