

(No Model.)

2 Sheets—Sheet 1.

G. B. MURRELL.  
GASOLINE STOVE.

No. 603,452.

Patented May 3, 1898.

FIG. 1.

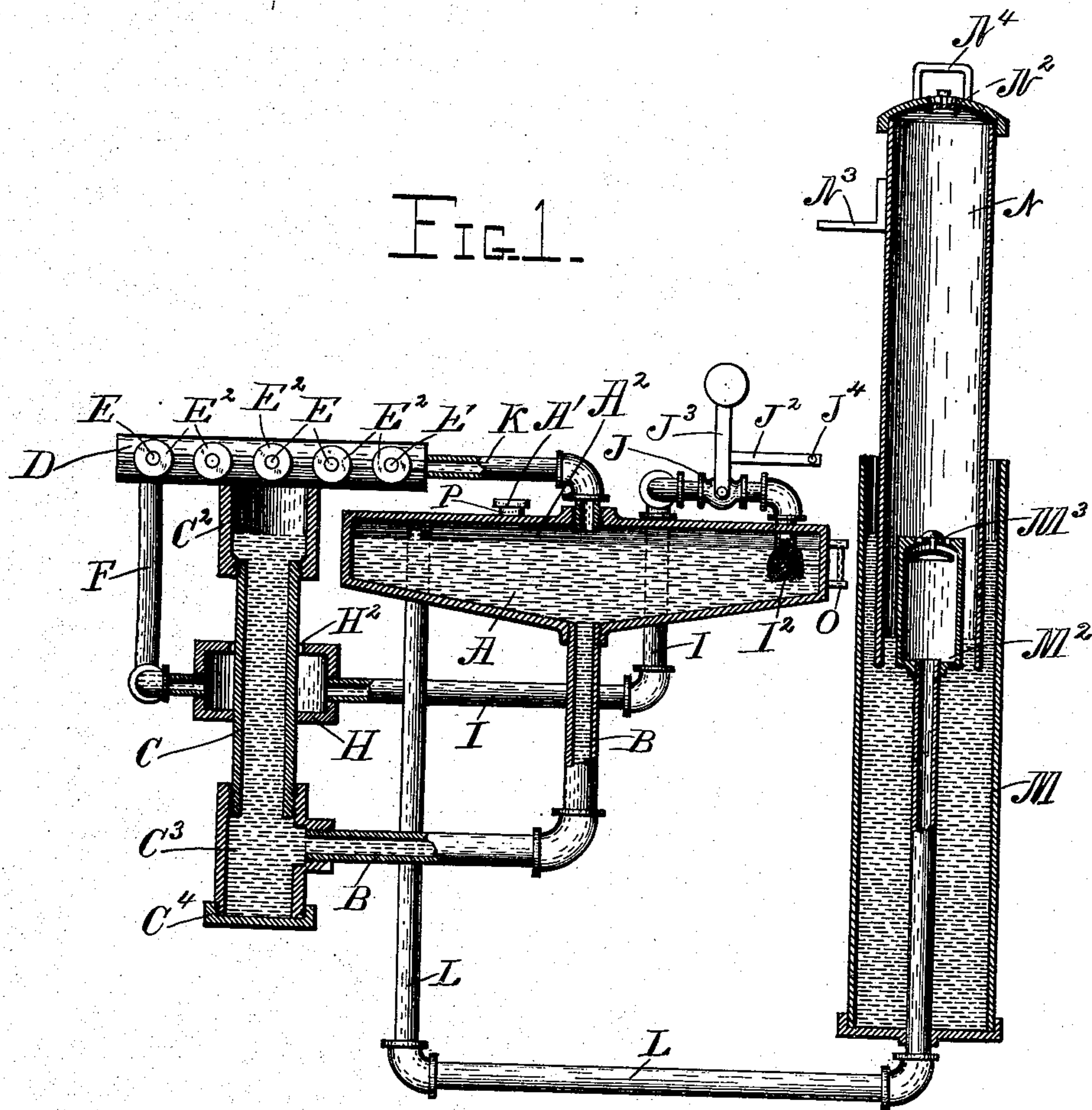
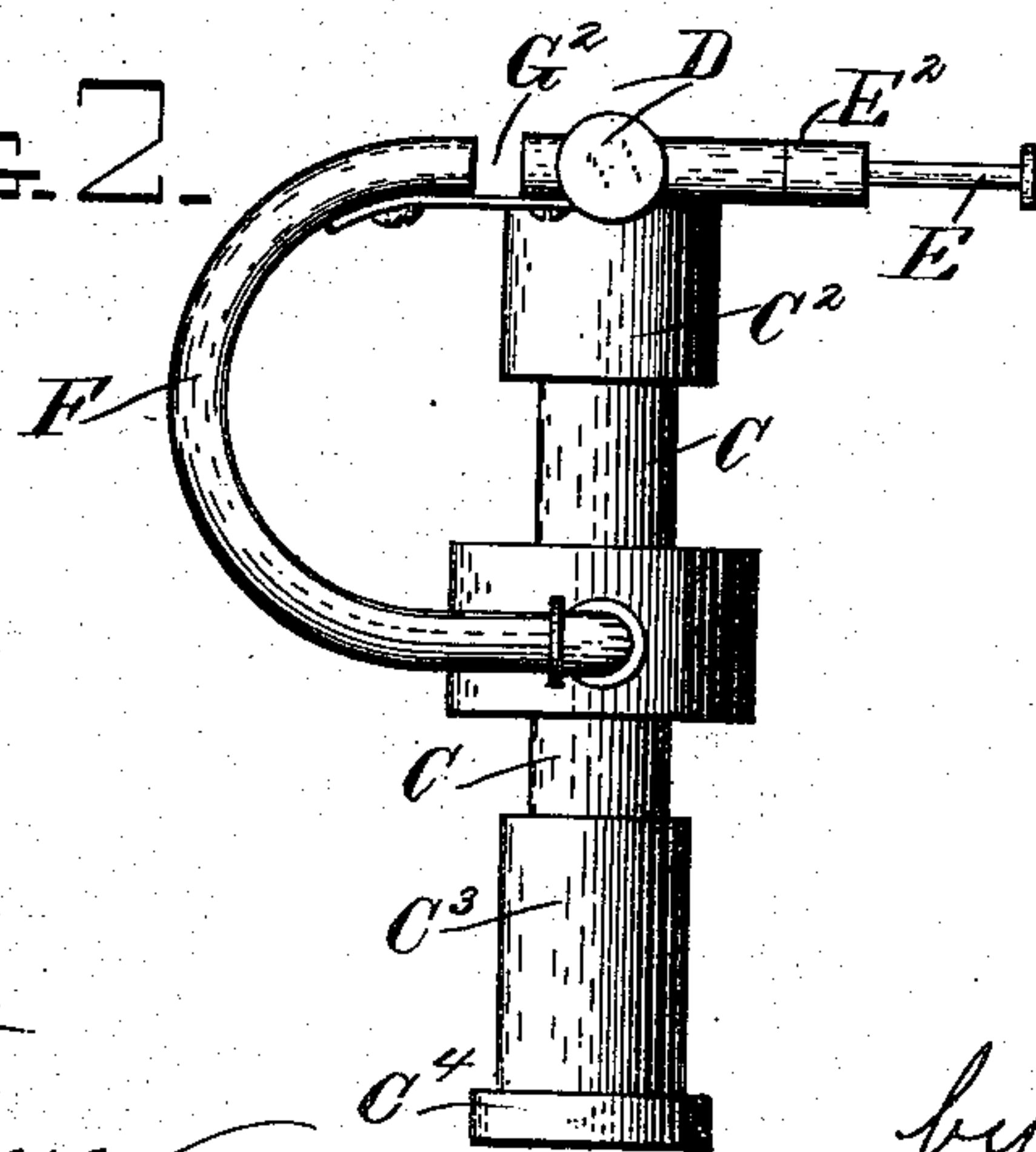


FIG. 2.



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(No Model.)

2 Sheets—Sheet 2.

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FIG. 3.

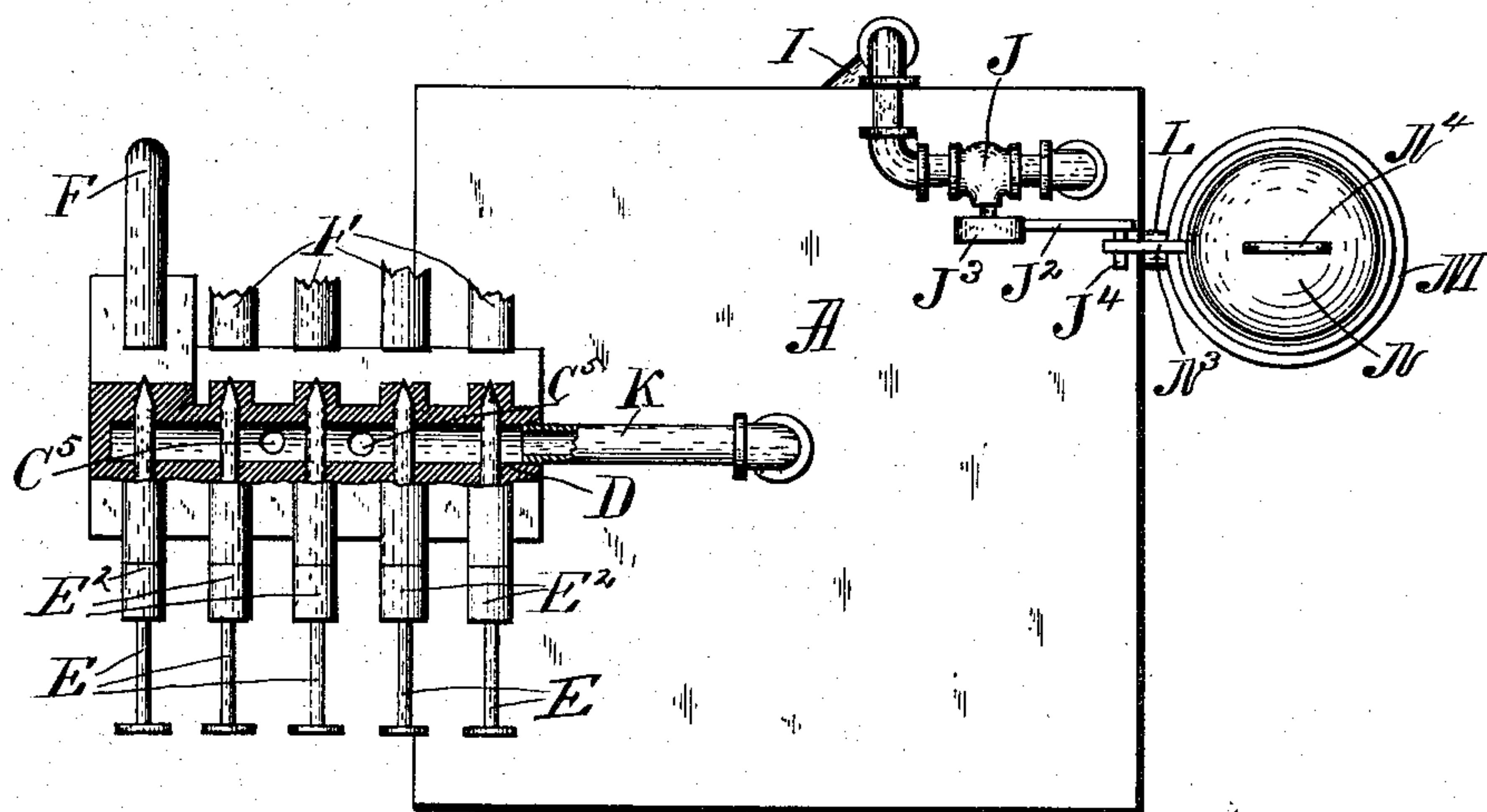
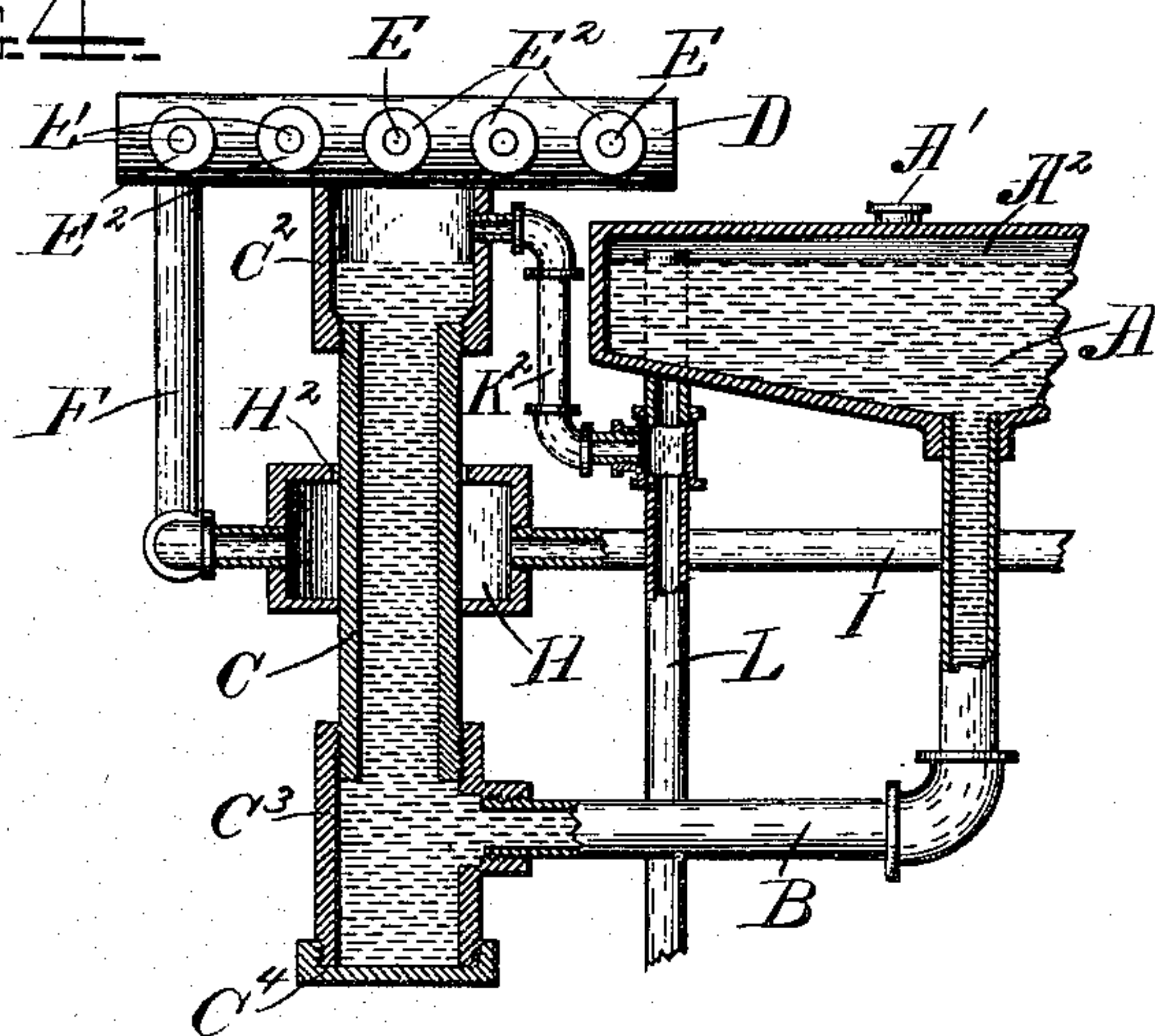


FIG. 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE B. MURRELL, OF NEWPORT, KENTUCKY.

## GASOLENE-STOVE.

SPECIFICATION forming part of Letters Patent No. 603,452, dated May 3, 1898.

Application filed August 10, 1896. Serial No. 602,244. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. MURRELL, a citizen of the United States, and a resident of the city of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Gasolene-Stoves, of which the following is a specification.

My invention relates to gasolene-burners; and it consists in the construction and combination of parts, as described in the specification and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is an elevation, mostly in section, of the apparatus illustrating my invention. Fig. 2 is a side elevation of the left-hand needle-valve holder, generator-pipe, subflame-chamber, and tube conveying commingled vapor and air to the subflame-chamber, looking from the left-hand side of the drawing. Fig. 3 is a top view of the apparatus illustrating my invention, parts being omitted and other parts being shown in section. Fig. 4 is a fragmentary sectional view showing a modified construction.

In the apparatus used A indicates the tank for the reception and storage of gasolene. This tank is preferably wide and broad, and its depth is preferably less than its width or breadth.

C indicates the generator-pipe. A pipe B extends from the bottom of the tank A to the lower portion of generator-pipe C. Gasolene being placed in the tank will run into the generator-pipe until it stands therein on a level with the gasolene in the tank. For this reason the needle-valves E and their holders B<sup>2</sup>, surmounting this pipe C and in communication therewith by means of the chamber D, will be located above the level of the highest point to which the gasolene may or can reach in the tank, and therefore for certainty of adjustment are preferably located above the top of the said tank A, substantially as shown.

My object in using a shallow tank is to prevent any great variation in the height of the gasolene in the generator without the use of a valve, as the gasolene in the generator cannot vary any more than the height of the tank. As minor constructions for convenience of easy and economical juncture the

lower portion of the pipe C consists of the T portion C<sup>3</sup> and the bottom cap C<sup>4</sup>. The latter is also of advantage in enabling the interior of the generator-pipe to be readily reached and cleansed. The upper portion of the generator-pipe consists of the portion C<sup>2</sup> and is preferably integral with that portion of the structure which consists of the needle-valve holders and tube D. These several portions C<sup>2</sup> C<sup>3</sup> C<sup>4</sup> are united together by screw-threads, as shown. In connection with the generator-pipe is located a subflame-chamber II, preferably constructed and applied so as to embrace the generator-pipe C, as shown in the drawings.

Each needle-valve is accompanied with its usual commingling-tube F, and between the latter and its accompanying needle-valve E is the usual space G<sup>2</sup> for enabling air to be drawn into the commingling-tube along with the vapor forcibly entering there from the needle-valve and mixing with such vapor in the usual manner. One of these needle-valves and commingling-tubes is devoted to feeding the chamber II with commingled vapor and air for making and feeding the subflame. The subflame is formed by vapor issuing from chamber II through the annular orifice H<sup>2</sup> in proximity to the generator-pipe and there lighted just above the orifice. The subchamber II also communicates with that space A<sup>2</sup> in the tank A which is above the gasolene and which contains air and gasolene vapor. This communication of subchamber II with space A<sup>2</sup> is effected by a pipe I, one end of which is connected to the subflame-chamber II, and the other at the roof of tank A opens into the latter. In the tank, at and below the mouth of this pipe I, extends a wicking I<sup>2</sup>, which by capillary attraction is kept filled with gasolene, so that air forced into the tank A and passing over the surface of the gasolene in the tank and through the wicking I<sup>2</sup> into the pipe I, according as the latter is permitted to convey it to the subflame-chamber II, as hereinafter mentioned, will be well charged with gasolene vapor and be fitted as a fuel-supply to the subchamber II. In this pipe I, preferably at a high point in its elevation, is located a valve J, capable of being primarily operated by a suitable tripping device. This device preferably consists as follows: The valve-shank carries an arm



J<sup>2</sup> and an arm J<sup>3</sup>, the latter usually weighted, as shown, and so located on the valve-shank with reference to the arm J<sup>2</sup> as that when the arm J<sup>2</sup> stands in position to be operated upon by the aerometer the arm J<sup>3</sup> will be substantially upright. In this position the valve J is open. When the arm J<sup>2</sup> is depressed, the arm J<sup>3</sup> falls forward after the arm J<sup>2</sup> and, being weighted, securely closes the valve J.

A communication between the chamber at the top of the generating-pipe and aerometer N is preferably established by means of the pipe K, leading from pipe D to the top part of tank A, and pipe L, leading from the top part of tank A to the aerometer N. The function of this pipe is to equalize the pressure between the tank and the generator and to prevent the gasolene in the generator from rising higher than that in the tank, thus insuring the safety of the apparatus in this particular by preventing the escape of gasolene at all times, whether it is caused by a leak in the burner or the needle-valve being opened. Should the subflame from any cause go out when the other burners are in use, the generation of vapor will be stopped and the air from the aerometer will pass through pipe K and escape through needle-openings, allowing the aerometer to rapidly descend. When it is down all the way, all pressure is removed and all escape of vapor ceases.

In order that commingled air and vapor should be supplied to the pipe I as fast as the latter conveys it to the subflame-chamber, as hereinafter mentioned, the tank A must be supplied with air under pressure. The pipe L, communicating with the vapor-and-air space in the tank, supplies the requisite air under pressure.

Another function of the aerometer is to keep the vapor in generator C under pressure after the generator is heated and when in use, and is used in lieu of an elevated tank such as is commonly used on gasolene-stoves, which is for the purpose of causing the vapor to leave the needle-openings with force, and thereby cause it to entrain air as it enters the commingling-tube. A suitable device for supplying such air under pressure to the pipe L is to be provided. A description of such device is as follows:

M indicates a receptacle preferably cylindrical and partially filled with water, and which may be denominated the "water-tank" M. The pipe L from the tank A extends to the water-tank M and enters the latter at or near the bottom thereof and extends centrally up within the cylinder on the axial line of said water-tank or in a line near to said axial line. It terminates at the top in a valve-chamber M<sup>2</sup>, inclosing a check-valve M<sup>3</sup>, which latter allows the air to enter the tube L at this end, but prevents its sudden egress therefrom. A movable vessel N, preferably cylindrical and nearly as large as the water-tank M, slides up and down with the lat-

ter. This vessel will be termed the "aerometer" N. It is closed at the top and open at the bottom. The valve M<sup>2</sup>M<sup>3</sup> is always within it even when said cylinder is the most highly elevated. In the top or upper portion of the aerometer N is a check-valve N<sup>2</sup>, preferably a flap-valve, allowing air to enter the aerometer as the latter is elevated, but preventing its egress as the aerometer descends. The aerometer is of such a length as that when it is down at the bottom of its movement its top and valve shall be above the surface of the water of the tank M and that when raised to its highest point its lower end will still be in the water of the tank. The aerometer carries at its side and near the top a stud or tappet N<sup>3</sup>, adapted as the aerometer sinks to strike a pin J<sup>4</sup> of the arm J<sup>2</sup> aforesaid and carry down the latter, thereby closing the valve, and thereby closing the pipe I. The aerometer is provided above with a suitable device N<sup>4</sup>, whereby it may be lifted by hand or by a rope attached thereto and run over a pulley.

The construction of my invention having been sufficiently described, a description of its mode of operation is as follows: The tank A is filled with gasolene, but not so high as the needle-openings nor so high as to close off the air-space in the tank, into which pipes K, I, and L enter, so as to prevent the air from passing from pipe L to pipes K and I. By filling the tank A the stand or generator pipe C is filled, as shown. The tank M is partially filled with water, as indicated. The aerometer N is elevated, as in Fig. 2, and the valve J opened, as shown in that figure. The aerometer, being allowed to descend, presses the air within it into the vapor-space of tank A and on through the wicking I<sup>2</sup>, through valve J and pipe I to the subflame-chamber. The air thus carried forward is permeated and mixed with the vapor of the hydrocarbon. As this mixture issues from the opening H<sup>2</sup> of the subflame-chamber it is lighted and begins to heat the generator-pipe C and the metal of the needle-valve holders, needle-valves, and chamber D. Any vapor thus generated in pipe C passes up into chamber D and through pipe K into tank A and is there condensed until needle-valves E are opened, when part or all of the vapor passes through them. The aerometer in its descent continues thus to furnish fuel. The needle-valve E of the commingling-tube F, which is to supply commingled air and vapor to the subflame-chamber, is opened. When the aerometer has nearly reached the lowest point of its movement, it has, through the agency of the tappet N<sup>3</sup>, depressed the arm J<sup>2</sup> and closed the valve J. Further supply of air and vapor through the pipe I is thus stopped, thereby stopping the rapid descent of the aerometer; but by this time, owing to the predetermined arrangement of the capacity of the aerometer in proper relation to the amount of commingled air and vapor furnished through pipe I



and needed for the heating of the generator to a degree sufficient to generate vapor from the gasoline within it, such vapor is already being generated by the generator and is passing through needle-valve E, as shown in Fig. 3, and into the commingling-tube F and there, mixed with air, furnishes a fuel for the flame, whereby the operation of keeping the generator C sufficiently heated to generate vapor for quite a while before the aerometer will go down is carried on. The aerometer is preferably at all times up while the burner is in use—that is to say, above the point where in descending it would rest. Being in this position, the aerometer produces the necessary pressure on the gasoline in the tank and generator by which a constant or steady and non-flickering flame is maintained at the burners. Then all burners may be turned on and the pressure be maintained until all the gasoline in the tank A is exhausted. It will be understood that the other needle-valves, in conjunction with their tubes F, supply fuel to the burners of stoves and other articles in any of the modes well known or that may be desired.

The preferred modes of outlet from the generator-pipe to the chamber D are through openings C<sup>5</sup> C<sup>5</sup>. (Shown in Fig. 1.)

The term "needle-valve," as used herein and in the following claims, will be understood to include not only a sharp valve, but any valve receiving vapor from the generator and introducing it to the commingling-tube.

It will be understood that the gasoline-tank can be filled through a suitable orifice P, closed with a screw-cap A', and that the tank is provided with a gage O, whereby the height of the gasoline in the tank can be at all times readily ascertained.

From the description heretofore given it is now obvious why it is that the kind of aerometer may be varied without necessarily altering the operation of other features of my invention.

Instead of the pipe or air-conduit K a pipe K<sup>2</sup>, connecting the pipe L with the space in the generator above the liquid gasoline, as shown in Fig. 4, may be employed. Either pipe K or pipe K<sup>2</sup> is practically a part of the space A<sup>2</sup> of the tank A in relation to the aerometer and serves to illustrate the application of that feature of my invention which, in combination with the gasoline-supply pipe connecting the lower portion of the gasoline-reservoir or supply-tank, covers, broadly, the application of an air connection between the aerometer and the vapor-space in the generator, by which the pressure in the generator and the tank is at all times the same, and the same level of gasoline in the tank and generator is maintained by gravity of gasoline.

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

1. In a gasoline-burner, the combination of a tank and generator, connections between the tank and the generator adapted to con-

vey gasoline from the tank to the generator, said tank and generator being so arranged relatively to each other that the gasoline stands at the same level in both, connections from the upper part of the generator to the upper part of the tank, and means for heating said generator, substantially as described.

2. In a gasoline-burner, the combination with a gasoline-tank, of a generator, a duct adapted to convey gasoline from said tank to said generator, the said generator being so situated relative to said tank that the gasoline maintains the same level in both, vapor-outlets mounted on said generator and communicating with the interior thereof, a duct leading from the upper portion of said tank to the upper portion of said generator and a burner adapted to heat said generator, with means for supplying vapor from said generator thereto, substantially as described.

3. In a gasoline-burner, the combination with a gasoline-tank, of a generator situated on a level with said tank, a duct leading from the lower portion of said tank to the lower portion of said generator and adapted to convey liquid gasoline from said tank to said generator, a duct leading from the space above the liquid in the tank to the space above the liquid in the generator, vapor-outlets carried by said generator and adapted to receive vapor therefrom, a burner adapted to heat the said generator and means for conveying vapor from said generator to said burner, substantially as described.

4. In a gasoline-burner, the combination with a generator having vapor-outlets, a gasoline-tank located on the same level with said generator, a duct adapted to conduct the liquid gasoline from said tank to said generator, a duct leading from the space above the gasoline in said tank to the space above the gasoline in said generator, a burner adapted to heat the said generator, means for conveying vapor from said generator to said burner and means for producing pressure upon the gasoline in said tank, substantially as described.

5. In a self-generating gasoline-burner, the combination with a generator, of a chamber communicating therewith, valves communicating with said chamber, commingling-tubes for said valves, a subburner for heating said generator, one of the said commingling-tubes supplying the said subburner with fuel from the generator, a gasoline-tank located on a level with said generator and ducts connecting the top and bottom of said tank respectively with the said chamber and generator, substantially as described.

6. In a self-generating gasoline-burner, the combination with a generator of a chamber mounted thereon and communicating therewith, needle-valves carried by said chamber, commingling-tubes for said valves, a subburner for heating said generator, one of the aforesaid commingling-tubes supplying said subburner with fuel from said generator, a gasoline-tank located on a level with said



generator, the space above the liquid gasoline in said tank communicating with the space above the gasoline in said generator, a duct adapted to conduct the liquid gasoline from said tank to said generator and means for producing air-pressure on the gasoline in said tank, substantially as described.

7. In a self-generating gasoline-burner, the combination with a generator, of a subburner for heating the said generator, an oil-tank and carbureter connected with said generator, the said tank being located on a level with said generator and having the top and bottom thereof connected to the said generator, an aerometer, and a duct connecting said aerometer with the space above the liquid in said gasoline-tank, substantially as described.

8. In a self-generating gasoline-burner, the combination with a generator, of a subburner for heating said generator, a gasoline-tank and carbureter, said tank being located on a level with said generator, said tank connected with said generator so that the gasoline maintains the same level in both generator and tank, an aerometer consisting of a chamber adapted to slide vertically in a water-tank, a valve in the upper part of said chamber, a duct leading from the air in said aerometer with the space above the liquid in said gasoline-tank, and a valve carried by said duct, substantially as described.

9. In a self-generating gasoline-burner, the combination with a generator, of a subburner for heating the same, a gasoline-tank and carbureter, said tank being located on a level with said generator and having the top and bottom thereof communicating with the said generator, an aerometer, a water-tank in which said aerometer is adapted to slide vertically, a valve in the upper part of said aerometer, a duct leading from the air in said aerometer to the space above the gasoline in the gasoline-tank, a valve carried by said duct, and means whereby the said aerometer stops the operation of said carbureter, substantially as described.

10. In a self-generating gasoline-burner, the combination with a generator, having a subburner for heating the same, and a gasoline-tank having a carbureter connected with said subburner, ducts connecting the top and bottom of said tank with said generator, a valve carried by said carbureter, of an aerometer, a water-tank in which the said aerometer is adapted to slide vertically, a valve in the upper part of said aerometer, a pipe leading from the air in said aerometer to the space above the liquid in said gasoline-tank, a valve carried by said pipe within said aerometer, the said aerometer adapted to engage and close the valve of the carbureter, substantially as described.

11. In a self-generating gasoline-burner, the combination with a generator and a subburner for heating the same, a gasoline-tank located substantially on the same level and communicating with the said generator, a

pipe connecting the space above the liquid in said gasoline-tank with said burner and provided with wicking over its mouth within said gasoline-tank, a valve carried by said pipe, an aerometer, a water-tank in which said aerometer is adapted to slide vertically, a valve in the upper part of said aerometer, a pipe connecting the air-space in said aerometer with the space above the liquid in said gasoline-tank, a valve carried by said pipe within said aerometer, the said aerometer being adapted to engage and close the valve of the carbureter, substantially as described.

12. In combination with gasoline-generator the tank A, generator-pipe C, needle-valve openings at a higher level than gasoline in tank A, subburner H adapted to heat generator from the level of the bottom of the tank to the top of generator, pipe K, pipe B, pipe L, air-pressure device M, substantially as and for the purpose specified.

13. The combination of needle-valves, and commingling-tubes, a generator for supplying the needle-valves with vapor, a subflame-burner contiguous to the generator, a commingling-tube from one of said valves to the burner, a gasoline-tank for supplying gasoline to the generator, a pipe I from the subflame-burner to the upper portion of said gasoline-tank and there provided with wicking over its mouth absorbing gasoline from the tank, and an aerometer sliding vertically in a water-tank, and having a valve in its upper part, and a pipe in the tank connecting the air in the aerometer with the space above the liquid in the gasoline-tank, and having a valve at its end in the aerometer, a valve J provided with an arm located in the pipe I, and a projection of the aerometer for enabling the descent of the latter to trip the valve and close the passage through pipe I, substantially as and for the purposes specified.

14. The combination of needle-valves, and commingling-tubes, a generator for supplying the needle-valves with vapor, a subflame-burner adapted to heat the generator, a commingling-tube from one of said valves to the burner, a gasoline-tank for supplying gasoline to the generator, a pipe I from the subflame-burner to the upper portion of said gasoline-tank and there provided with wicking over its mouth absorbing gasoline from the tank, and an aerometer sliding vertically in a water-tank, and having a valve in its upper part, and a pipe in the tank connecting the air in the aerometer with the space above the liquid in the gasoline-tank, and having a valve at its end in the aerometer, a valve J located in the pipe I and provided with the arm J<sup>2</sup>, and pin J<sup>4</sup>, and weighted arm J<sup>3</sup>, substantially upright when the valve is open, and a projection N<sup>1</sup> on the aerometer, for depressing the arm J<sup>3</sup> and closing the valve as the aerometer descends, substantially as and for the purposes specified.

15. The combination of needle-valves, and



commingling-tubes, a generator for supplying the needle-valves with vapor, a subflame-burner adapted to heat the generator, a commingling-tube from one of said valves to the burner, a gasolene-tank for supplying gasolene to the generator, a pipe I from the subflame-burner to the upper portion of said gasolene-tank and there provided with wicking over its mouth absorbing gasolene from the tank, and an aerometer sliding vertically in a water-tank, and having a valve in its upper part, and a pipe in the tank connecting the air in the aerometer with the space above the liquid in the gasolene-tank, and having a valve at its end in the aerometer, a valve J located in the pipe I, and means for enabling the aerometer to close the valve, substantially as and for the purposes specified.

16. The combination of needle valves, commingling-tubes, generator-pipe, subflame-burner adapted to heat the generator from bottom of tank to the top of generator, a commingling-tube from one of the needle-valves to the subflame-burner, a gasolene-tank, the gasolene in same being at a lower level than the needle-valves, a gasolene-pipe B from the tank to the generator, a conduit from the space above the gasolene in tank to the space above the gasolene in the generator, a pipe I leading from space above the gasolene in tank A to a subflame-burner and adapted for primary heating of generator, a valve in pipe I, a pipe L for supplying air to the space above the liquid in said tank, and a device for supplying air under pressure to pipe L, and means for closing the valve of pipe I by the movement of the air-pressure device, substantially as and for the purposes specified.

17. The combination of the needle-valves, commingling-tubes, generator-pipe, subflame-burner contiguous to generator-pipe, a gasolene-tank on a level with the generator, a gasolene-pipe B from the tank to the generator, a pipe I to the subflame-burner chamber from the space above the liquid in the tank and having a wicking at its mouth adapted to absorb gasolene from the tank, a valve in said pipe, a pipe L for supplying air to the said space above the liquid in the tank, and a device for supplying air under pressure to the pipe L, and a pipe K, connected to the said space in the tank A, and the pipe D connecting the upper end of the generator to the pipe K, substantially as and for the purposes specified.

18. The combination of needle valves, commingling-tubes, generator-pipe, a subflame-burner adapted to heat the generator, a gasolene-tank on a level with the generator, a gasolene-pipe B from the tank to the generator, a pipe I to the subflame-burner chamber from the space above the liquid in the tank and having a wicking at its mouth adapted to absorb gasolene from the tank, a valve in said pipe, a pipe L for supplying air to the space above the liquid in the tank, and a device for

supplying air under pressure to the pipe L, and a pipe K, connected to the said space in the tank A, and the pipe D connecting the upper end of the generator to the pipe K, and means for closing the valve of pipe I, substantially as and for the purposes specified.

19. The combination of the needle-valves, and their commingling-tubes, and a generator, a subflame-burner adapted to heat the generator, a gasolene-tank substantially on a level with the generator, a pipe therefrom to the generator to supply the latter with gasolene, a pipe having wicking at its mouth, adapted to absorb gasolene from the tank, at the upper part of the gasolene-tank, and connected to the subflame-burner, a pipe for supplying air under pressure to the gasolene-tank, and means substantially as described for preventing the gasolene in the generator from rising to a higher level than that in the tank, substantially as and for the purposes specified.

20. The combination of the needle-valves, and their commingling-tubes, and a generator, a subflame-burner adapted to heat the generator, a gasolene-tank on a level with the generator, a pipe therefrom to the generator to supply the latter with gasolene, a pipe having wicking at its mouth adapted to absorb gasolene at the upper part of the gasolene-tank, and connected to the subflame-burner, a pipe for supplying air under pressure to the gasolene-tank, and a pipe arranged to communicate with the upper part of the generator and the space above the liquid in the tank, for keeping the gasolene in the tank and generator at a common level, substantially as and for the purposes specified.

21. The combination of needle-valves, and commingling-tubes, a generator for supplying the needle-valves with vapor, a subflame-burner contiguous to the generator, a commingling-tube from one of said valves to the burner, a gasolene-tank for supplying gasolene to the generator, a pipe I from the subflame-burner to the upper portion of said gasolene-tank and there provided with wicking over its mouth absorbing gasolene from the tank, and an aerometer sliding vertically in a water-tank, and having a valve in its upper part, and a pipe in the tank connecting the air in the aerometer with the space above the liquid in the gasolene-tank, and having a valve at its end in the aerometer, a valve J located in the pipe I, and an arm of the valve, and a projection of the aerometer for enabling the descent of the latter to trip the valve and close the passage through pipe I, and the pipe K, establishing connection between the spaces above the liquid in the generator and the gasolene-tank, substantially as and for the purposes specified.

GEORGE B. MURRELL.

Attest:

WM. E. JONES,  
K. SMITH.