

995,856.

A. S. FREEMAN.  
GASOLENE BURNER.  
APPLICATION FILED JUNE 27, 1910.

Patented June 20, 1911.

Fig. 1.

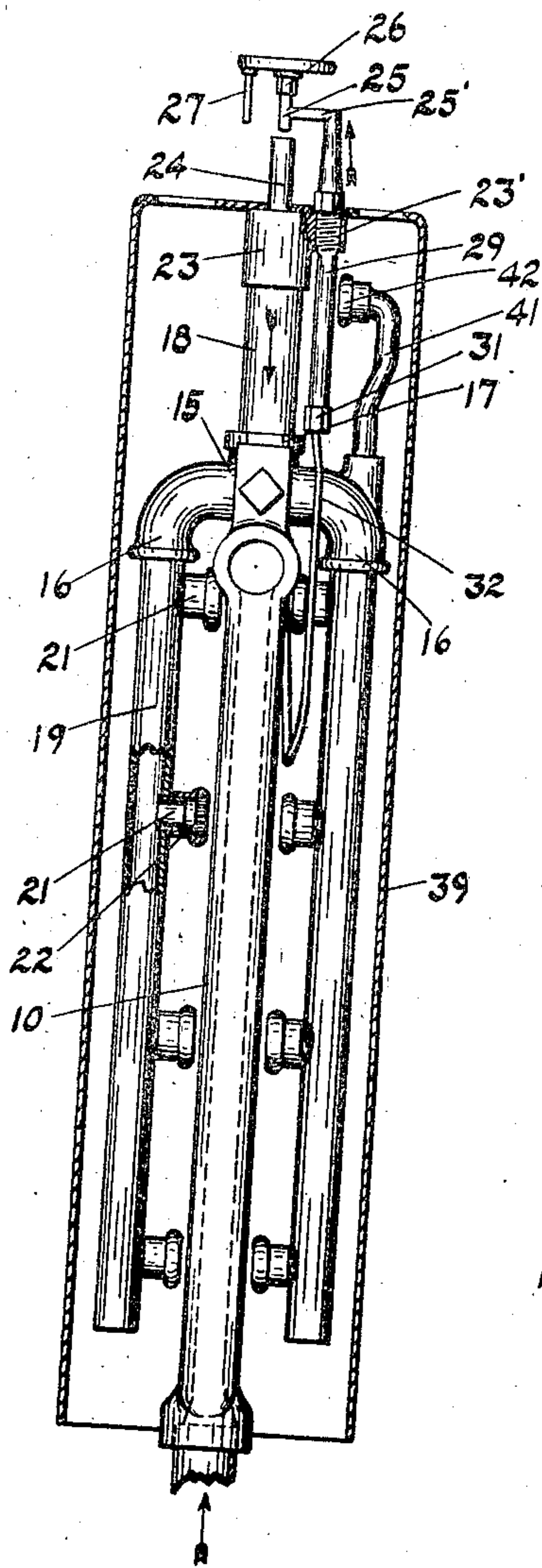


Fig. 2.

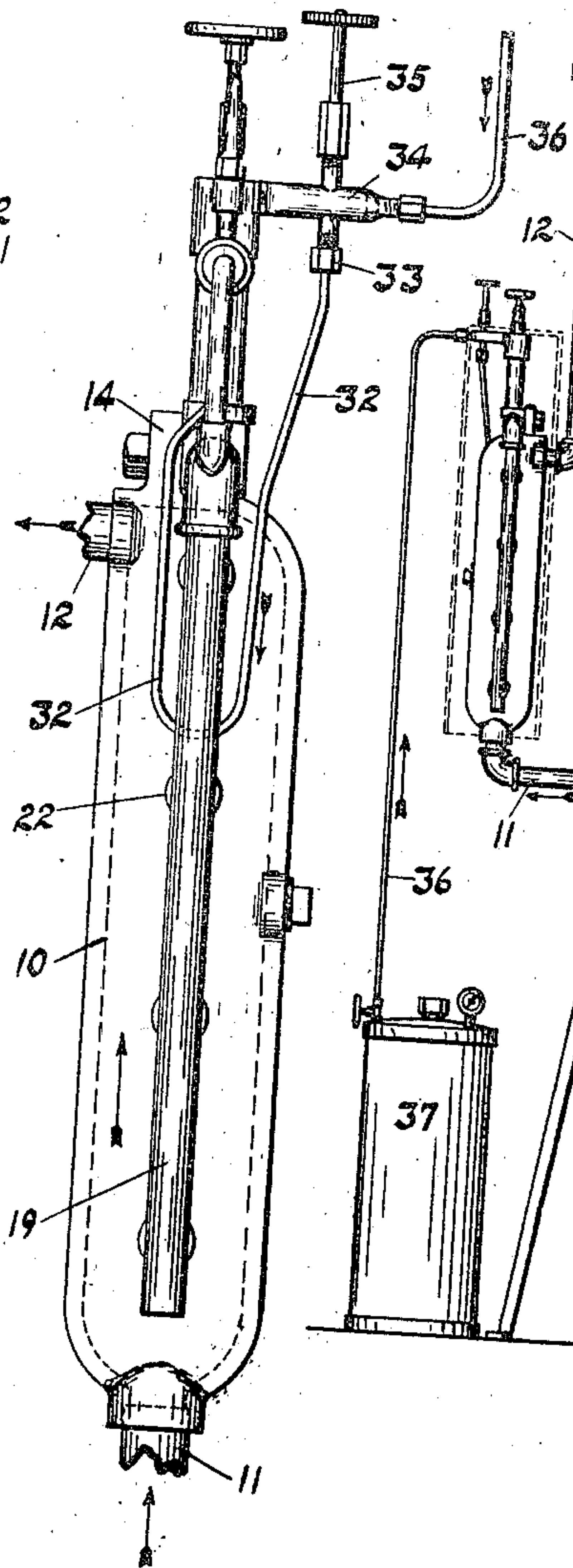
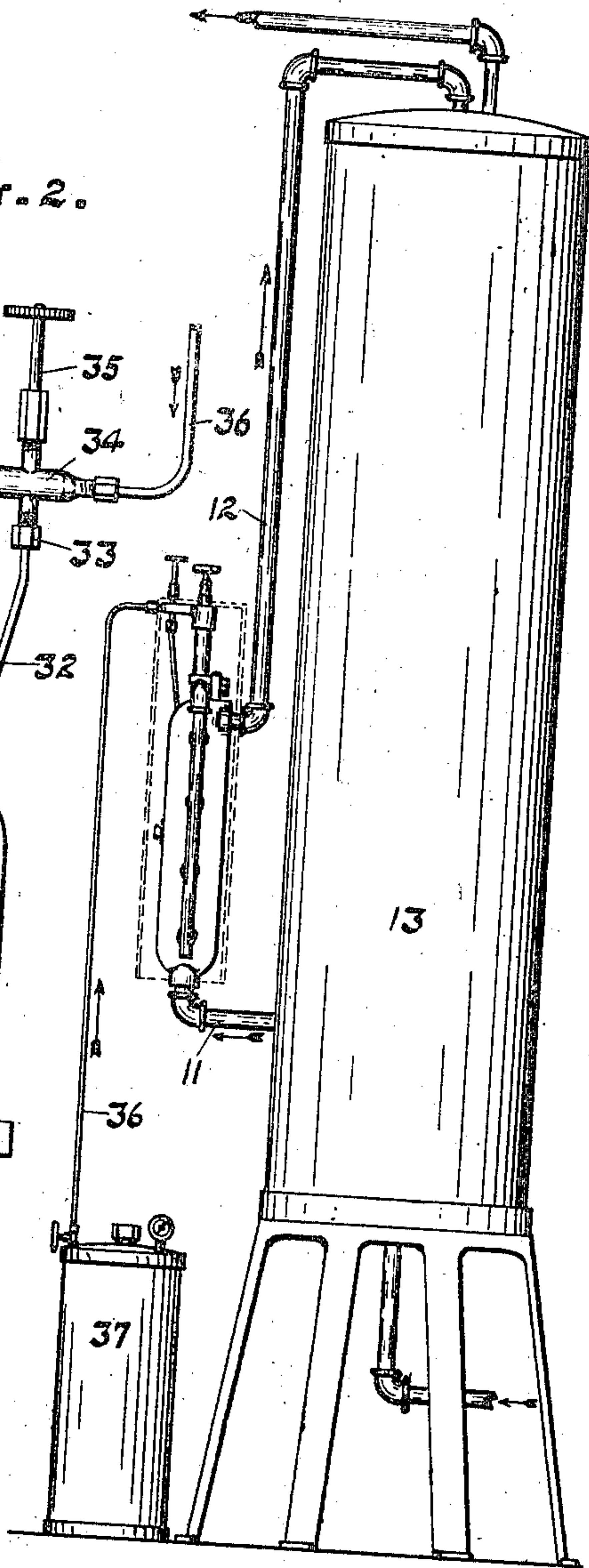


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## GASOLENE-BURNER.

995,856.

Specification of Letters Patent. Patented June 20, 1911.

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*To all whom it may concern:*

Be it known that I, ALBERT S. FREEMAN, a citizen of the United States, residing at Alexandria, in the county of Madison and State of Indiana, have invented a new and useful Gasolene-Burner, of which the following is a specification.

The object of my invention is to produce an apparatus, more especially designed for ready attachment to existing hot water reservoirs, by means of which water may be heated by gas produced by the apparatus from a supply of gasolene or other similar volatile fuel.

The accompanying drawings illustrate my invention.

Figure 1 is an elevation in partial vertical section of my improved generator and heater; Fig. 2 an elevation at right angles to that shown in Fig. 1 and with the inclosing casing omitted, and Fig. 3 an elevation of the complete apparatus associated with the water reservoir.

In the drawings, 10 indicates a flat thin hollow body or heating chamber within which may be maintained a comparatively thin body of water. Leading into the bottom of the heating chamber 10 is an inlet pipe 11 and leading from the top of said chamber is a discharge pipe 12. The pipe 11 is adapted for connection with the lower region of the water reservoir 13 and the pipe 12 is adapted for connection with the upper regions of said reservoir. The upper end of the body 10 is provided with a finger or bracket 14 to which I secure a hollow cross-head 15 provided with oppositely extending down-turned branches 16, 16 and a central upward receiving branch 17 into which is secured the lower end of a mixture pipe 18. Secured to each branch 16 and depending therefrom alongside of a flat face of the main body 10 is a gas pipe 19 provided with a plurality of laterals 21 which extend toward the adjacent flat face of body 10. Secured to the outer end of each of the laterals 21 is a suitable burner nipple or nozzle 22, so arranged as to direct the burning gas upon the adjacent flat face of body 10.

Secured to the upper end of pipe 18 is a tubular cap 23 provided with a central mixing tube 24 into the open upper end of which is directed a gas nozzle 25 in which is mounted an ordinary controlling needle

valve operated by a head 26 secured thereto. Head 26 is provided with a depending finger 27 adapted to engage a lateral 25', forming part of the nozzle 25, so as to limit the movement of the head 26 to about one complete turn. Nozzle 25 is integral with superheater tube 29 which is supported in an extension 23' of the cap 23. The superheater tube 29 extends alongside of the mixture tube 18 and at its lower end it is connected by a suitable coupling 31 with a generator or vaporizing pipe 32. The pipe 32 extends for a short distance downwardly from the lower end of the superheater tube 29 alongside one flat face of body 10 and passes from thence upwardly to a coupling 33 by means of which it may be attached to a valve body 34 in which is mounted a suitable controlling valve 35 by means of which the flow of gasolene to pipe 32 may be controlled. Leading into the valve body 34 is a suitable supply pipe 36 which may be connected to any suitable source of fuel supply, as for instance the ordinary pressure tank 37.

The entire generator and heater structure may be readily incased by a tubular casing 39 sleeved down over the structure and supported upon cap 23 as clearly shown in Fig. 1 and as indicated by dotted lines in Fig. 3.

Leading upward from the hollow head 15 is a small pipe 41 to the upper end of which is attached a suitable burner 42 which is directed toward the superheater tube 29 and the mixture tube 18.

The operation is as follows: To start the apparatus, nozzle 25 is first heated by any suitable means, such for instance as an ordinary gasolene torch. When the nozzle 25 has been properly heated valve 35 and the valve controlled by head 26 are opened and gasolene flows from head 34 down through pipe 32, thence upwardly through the superheater pipe 29 and nozzle 25 where it is vaporized and passes from thence through mixture tube 18 and from thence through the branches 16 to pipe 19 and emerges through the burners 22 against the flat faces of the heater body 10. At the same time a portion of this gas rises from the head 15 through tube 41 to the burner 42 and is lighted, whereupon the flame from this burner 42 envelops the superheater tube 29 and the mixture tube 18.

I have found from practice that it is desirable to heat the gasolene feed tube at a



point as closely as possible adjacent the discharge therefrom to the mixer because otherwise the volatilized fuel is not sufficiently hot to properly mix with the air. I also find  
 5 that it is desirable that the mixture of gas and air be also thoroughly heated before it reaches the burners, as by that means I am able to secure a proper non-explosive mixture of gasolene vapor and air which, because of its high heat, will burn with practically a colorless flame against the water  
 10 cooled walls of the heater body 10.

By the arrangement shown I am enabled to practically entirely envelop the water  
 15 heater body 10 and, because of the thinness of the column of water in the body, to heat the said column almost instantaneously. By turning head 26 in closing direction until finger 27 engages lateral 25', the nozzle valve  
 20 is brought to a point where just a sufficient amount of gas will emerge to maintain the burner 42 in generating condition, while by turning the head 26 in the opposite direction to its full amount the maximum supply of  
 25 gas is obtained.

It will be readily understood that the generator described herein may be used in connection with other forms of heaters.

The particular form of heater shown is  
 30 readily attachable to existing water tanks which are now commonly found either in connection with water backs of coal burning ranges or provided with heaters of various kinds capable of burning illuminating gas.

35 It will be noticed that, in the arrangement I have shown, the gasolene is vaporized in the tube 32 because that tube passes down alongside the heater body 10 and comes within the influence of the flames from the  
 40 adjacent burners 22. The gasolene vapor thus produced in the tube 32 expands into the larger superheater tube 29 where it is superheated by the burner 42. It is also to be noticed that, by reason of this heating of

gasolene vapor, I am able to discharge the  
 45 vapor through a downwardly presented nozzle thus making it possible to bring the nozzle valve and the gasolene valve 35 to the upper part of the structure where they can be readily manipulated. The structure how-  
 50 ever is of such character that it will work satisfactorily in any position of direction of the nozzle 25.

I claim as my invention;

1. The combination of a mixture tube, two  
 55 burner nozzles leading from the mixture tube, a vaporizing tube carried through the heating zone of one of said burner nozzles, a superheating tube receiving the discharge from the vaporizing tube and carried  
 60 through the heating zone of the other of said burner nozzles, and a nozzle receiving the discharge from said superheating tube and discharging into the mixture tube, the initial  
 65 portion of the mixture tube also lying in the heating zone of one of said burner nozzles.

2. A vapor burner comprising a mixture tube, a super-heater arranged alongside the mixture tube, a nozzle leading from the  
 70 super-heater tube and directed into the mixture tube, a valve for controlling the outflow from said nozzle, a vaporizing tube leading to the super-heater tube, a burner nozzle leading from the mixture tube and having  
 75 a heating zone through which the vaporizing tube passes, and a second burner nozzle leading from the mixture tube and directed toward the super-heater tube and initial end  
 80 of the mixture tube whereby said super-heater tube and initial end of the mixture tube will lie in the heating zone of said second burner.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana.

ALBERT S. FREEMAN. [L. S.]

Witnesses:

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