L. S. LAWSON.

VAPOR GENERATOR AND BURNER.

APPLICATION FILED AUG. 19, 1912.

1,059,739. Patented Apr. 22, 1913.

FIG. 1.

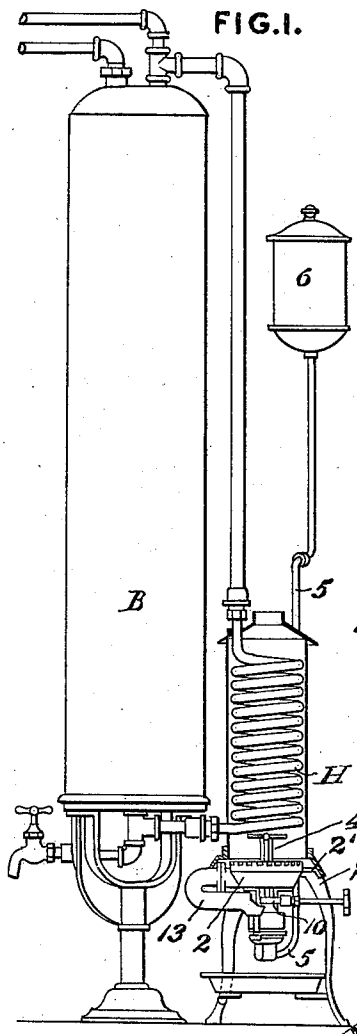


FIG. 2.

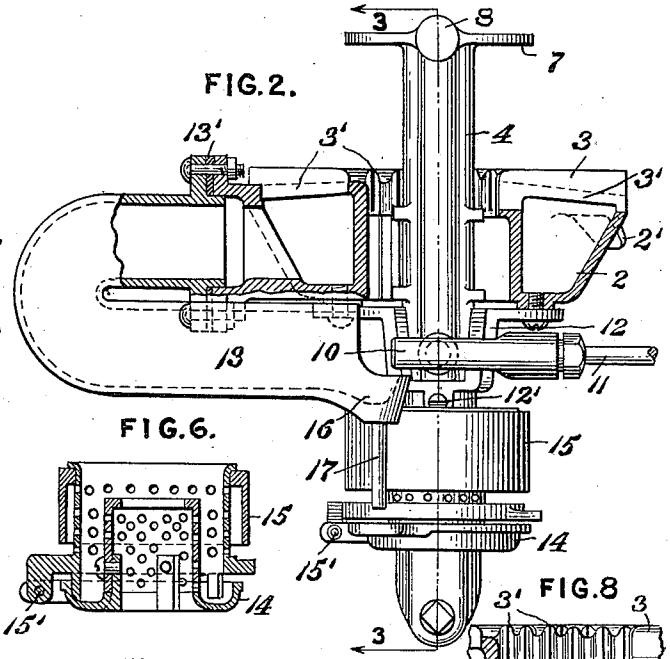


FIG. 6.

FIG. 8

FIG. 7.

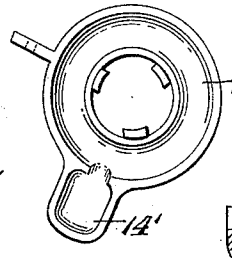


FIG. 3.

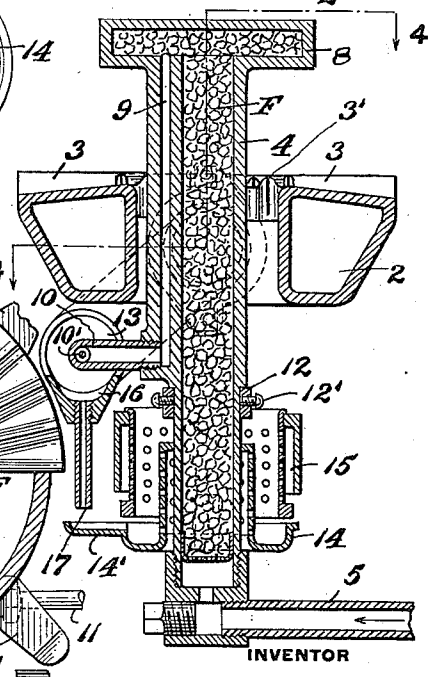


FIG. 4.

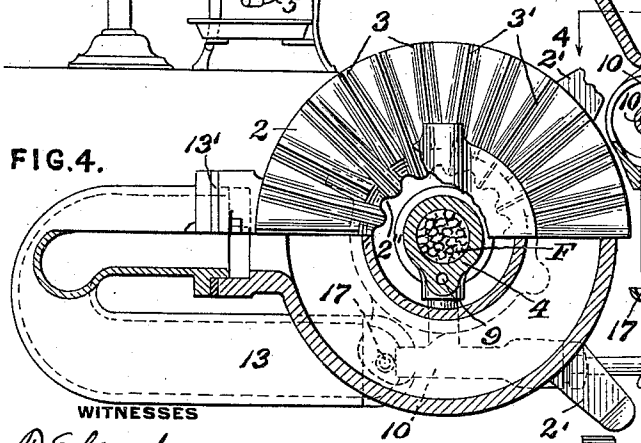
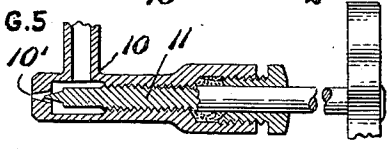


FIG. 5



WITNESSES

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VAPOR GENERATOR AND BURNER.

1,059,739. Specification of Letters Patent. Patented Apr. 22, 1913.

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To all whom it may concern:

Be it known that I, LINDLEY S. LAWSON, a resident of Homestead, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Vapor Generators and Burners, of which the following is a specification.

This invention relates to a vaporizer and burner for heating purposes, and the primary object is to provide for controlling the flow of vapor to the main burner and liquid hydrocarbon to a preliminary or fluid burner by a single valve, the arrangement being such that upon opening the valve fluid is passed to the preliminary or heating-up burner, and later the same valve is utilized for passing vapor from the generator to the main burner. After being started the generation of vapor is maintained by the main burner, and a further purpose is to provide an efficient vaporizing chamber of such construction and so arranged with relation to the main burner that an ample amount of vapor is generated so long as the burner is in use.

The invention also includes certain improvements in the burner, also improved means for mixing the air and vapor and for passing the same to the vapor burner.

In the accompanying drawings, Figure 1 is an elevation of the improved burner shown in position in connection with a coil water heater, the use for which the burner is especially designed. Fig. 2 is a view of the burner partly in elevation and partly in vertical section. Fig. 3 is a vertical section on line 3—3 of Fig. 2. Fig. 4 is a view partly in top plan and partly in sectional plan, taken on line 4—4 of Fig. 3. Fig. 5 is a sectional detail of the valve. Fig. 6 is a sectional elevation of the fluid burner for preliminarily heating the vaporizing chamber, and Fig. 7 is a top plan of the same. Fig. 8 is a sectional elevation of a portion of the burner.

Referring to the drawings, the annular hollow vapor burner 2 is of ring-like form with its top surface consisting of a series of radially disposed ribs 3, with the alternate ribs projecting into the inner periphery of the ring burner and forming vertical flue-like spaces 2″, and as the longitudinal gas-emitting slots 3′ of the longer ribs extend well down through the inner ends of the longer ribs the spaces 2″ constitute flues or ducts for passing air to and around said slot extremities which mixes with the issuing gas in such manner as to materially improve the combustion. An intensely hot flame is thus provided around the vaporizing chamber. The intermediate ribs 3 are shorter than the flute-forming ribs and are simply slotted from end to end as shown.

In adapting the invention to a coil water heater H, Fig. 1, the latter connected in usual manner to a stand boiler B, burner 2 may be provided with lugs 2′ for sustaining it on support S of heater H, though it will be understood that the improved apparatus may be variously supported.

The tubular upright vaporizing chamber 4 extends upwardly through ring-like burner 2 with portions thereof above and below the burner. Connecting with the lower end of the chamber is the hydrocarbon inlet pipe 5 which may extend from the elevated tank 6 for supplying the liquid fuel by gravity. Broken quartz or equivalent material F within the chamber filters the liquid hydrocarbon and divides or separates it in such manner as to facilitate vaporization. The upper extremity of chamber 4 is preferably formed with the laterally projecting head or baffle 7 which partially overhangs the flame-sustaining top surface of burner 2 for radiating heat to the chamber. The upper portion of the chamber is also cored transversely in the plane of the baffle, as indicated at 8, to provide a lateral channel which communicates with the downwardly extending duct 9 formed in one side or wall of chamber 4, and connecting with the lower end thereof is the outlet fitting 10 having its discharge orifice 10′ controlled by needle valve 11 of usual construction. Chamber 4 is supported by bracket 12 secured to the under side of burner 2, being adjustable vertically through the bracket and held by set screws 12′.

Fitting 10 is arranged to discharge into the lower open end of a tube or mixing chamber 13 which is bent upwardly and backwardly and secured to and communicating with one side of vapor burner 2, as shown at 13′, Fig. 2. As the lower end of tube or chamber 13 is open to the atmos-

phere the vapor discharging thereinto draws in the requisite amount of air for the fuel mixture, as will be understood.

Embracing the lower portion of the vaporizing chamber is an oil burner which consists of a trough-like base portion 14 and an upper wall-portion 15 of familiar construction for which no novelty is claimed, the latter preferably hinged to the base at 15′, Figs. 2 and 6. This preliminary or liquid burner is beneath the open end of tube or chamber 13, and the latter is formed with bottom depression 16 from which extends downwardly short tube 17 toward trough offset 14′.

When the burner is not in use the vaporizing chamber stands filled with liquid hydrocarbon, and by opening valve 11 some of this liquid fluid is discharged into depression 16 at the open end of chamber 13 and from thence is conducted downwardly through tube 17 into trough or channel 14 through its offset 14′ and the liquid burner is ignited, thereby heating up chamber 4 and converting into vapor the liquid contained therein. Then upon opening valve 11 the vapor thus generated discharges downwardly through duct 9 into mixing chamber 13 and from thence is passed into the main burner 2, and as the latter heats the generating chamber the burner is self-sustaining.

The mechanism is of simple construction, is highly efficient, and only one valve is required for controlling the fuel supply for both burners.

I claim:—

1. The combination of a vaporizing chamber, a vapor burner and a fluid burner arranged contiguous to said chamber, a hydrocarbon inlet and a valved outlet for the chamber, a tube open at its lower end and at its upper end communicating with the vapor burner with the open end of the tube higher than the fluid burner with said valved outlet adapted to discharge into the open end of the tube, and a tube extending downwardly from the first mentioned tube for conducting fluid from the latter to the fluid burner.

2. The combination of a tubular upright vaporizing chamber having a downwardly extending duct formed in a wall thereof which communicates with the upper portion of the chamber, a vapor burner and a liquid burner arranged contiguous to the chamber with the liquid burner below the vapor burner, a valved outlet for the duct, means for establishing communication between the valved outlet and the vapor burner, and means for conducting fluid from the valved outlet to the liquid burner.

3. A hollow vapor burner of ring form having its inner periphery fluted vertically and with the top surface of the burner formed with vapor-emitting slots which extend downward in the ridges of the fluted surface.

4. A hollow vapor burner of ring form having its top surface formed with slotted radial ribs, some of the ribs extending inwardly and forming projections in the inner periphery of the burner and with vertical air passages between the projections.

5. The combination of a hollow ring-like vapor burner having its axis disposed vertically and having vapor outlets in the top wall of the burner and similar outlets in the inner ring-like wall thereof with the vapor adapted to burn as it emerges from said outlets, a vaporizing chamber extending upwardly through the ring-like burner and spaced from the inner wall of the latter, the upper portion of the chamber enlarged laterally and spaced above the burner and overhanging the gas emitting top surface of the latter, a fluid inlet for the burner, and means for conducting vapor from the chamber to the burner.

6. The combination of a ring-like vapor burner having its axis disposed vertically, a vaporizing chamber surrounded by the burner, the chamber extending above the burner and provided with a vapor outlet passage extending from the upper portion thereof downwardly through the burner, and a fluid inlet for the vaporizing chamber.

7. A vapor burner having a vertical passage formed therethrough with the wall of the passage fluted vertically and formed with vapor emitting openings, the flutes of said wall being open vertically at their upper and lower ends for the free circulation of air vertically therethrough.

8. A vapor burner having a vertical passage formed therethrough with the wall of the passage fluted vertically and formed with vapor emitting openings, the flutes of said wall being open vertically at their upper and lower ends for the free circulation of air vertically therethrough, a vaporizing chamber within the vertical passage of the burner and extending above the latter, means for conducting vapor from the upper portion of the chamber to the burner, and a fluid inlet for said chamber.

9. The combination of a vapor burner, a U-shaped vapor conducting tube having one leg higher than the other and with the higher leg communicating with the burner and with the extremity of the lower leg open to the atmosphere, a vaporizing chamber in position to be heated by the vapor burner, a valved outlet for the vaporizing chamber extending into the lower leg of the vapor tube for discharging either vapor or liquid thereinto from the vaporizing chamber, a fluid burner for heating the chamber with said fluid burner at a lower level than the lower leg of the vapor tube,

and means for conducting fluid from said lower leg to the fluid burner.

10. The combination of a vapor burner, a vapor tube having a cup-formed open end with the opposite end of the tube communicating with the burenr, a vaporizing chamber adapted to be heated by the vapor burner, a valved outlet for the chamber adapted to discharge into the cupped end of the vapor tube, a liquid burner for heating the vaporizing chamber, means for conducting liquid from the cupped end of the vapor tube to the liquid burner, and a fluid inlet for the vaporizing chamber.

11. The combination of a vapor burner, a liquid burner spaced downwardly from the vapor burner, a vaporizing chamber in position to be heated by both of said burners, a valved outlet for the vaporizing chamber located in a plane between the two burners, means for conducting vapor from said outlet to the vapor burner, means for conducting liquid from said outlet to the liquid burner, and a fluid inlet for the vaporizing chamber.

12. The combination of a ring-like vapor burner, a ring-like liquid burner beneath and spaced from the vapor burner with the axes of said burners disposed vertically, a vaporizing chamber extending upwardly through both burners, a valved outlet for the vaporizing chamber located in a plane between the two burners, means for conducting vapor from said outlet to the vapor burner, means for conducting liquid from said outlet to the liquid burner, and a fluid inlet for the vaporizing chamber.

In testimony whereof I affix my signature in presence of two witnesses.

LINDLEY S. LAWSON.

Witnesses:
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JOHN W. BAINBRIDGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."