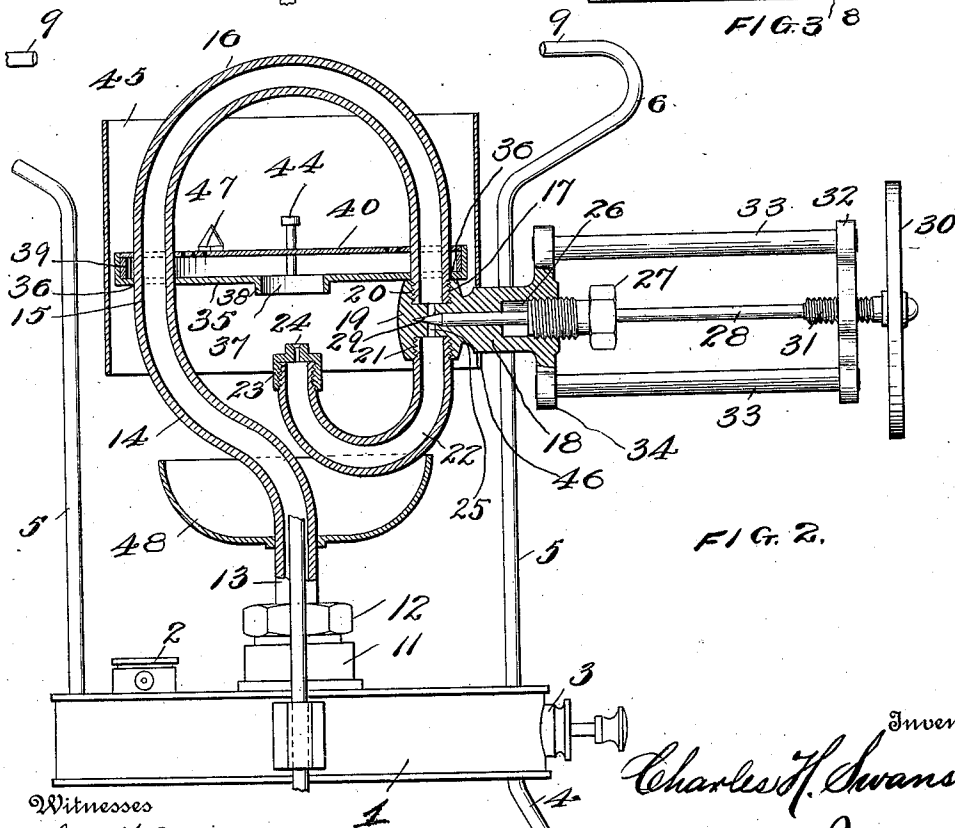
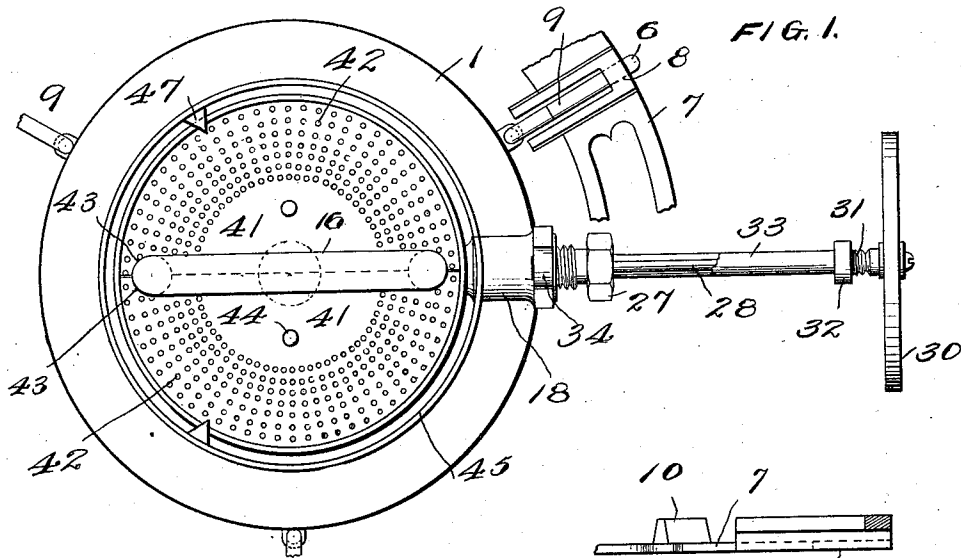


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HYDROCARBON VAPOR BURNER.
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1,018,944.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES H. SWANSON, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Hydrocarbon-Vapor Burners, of which the following is a full, clear, and exact description.

The invention relates to that class of hydro-carbon stoves or heaters which are equipped with a reservoir containing a hydrocarbon liquid under pressure, and especially contemplates improved and effective means for generating vapor or gas for consumption at the burner, and also the means for mixing the gaseous fuel, at the burner.

The invention consists essentially in novel form of vapor generating channel and fuel mixing chamber, and further, in certain novel features of combination and arrangements of parts as will be hereinafter pointed out and set forth in the claims.

In the accompanying drawings I have illustrated one example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles of the invention, and one that has proven highly satisfactory and efficient in actual practice.

Figure 1 is a top plan view of the stove or burner, showing a fragmentary portion of the utensil support or frame, above the burner. Fig. 2 is a vertical central sectional view of a portion of the stove, other parts being shown in elevation, and Fig. 3 is a detail view of a fragment of the utensil support.

As before stated, I have embodied in the construction of the stove, a hydrocarbon-liquid reservoir as 1, provided with the usual feed plug 2, and a suitable air pump 3. The reservoir is supported by a plurality of uprights, three being illustrated in this instance, which form legs, as 4 below the reservoir, and the upper portions form standards 5. The upper ends of the standards 5 are bent at 6 to form supports for the annular ring 7, upon which ring the utensil may be seated. The ring 7 is provided with suitable recesses or grooves 8 in which the horizontal portion 9 of the bent standard is seated, to hold the ring in place. A series of lugs 10 may be cast upon the ring 7 to form a grid.

The vapor generating device, the mixing receptacle, the burner, and accessories, are

all supported from the reservoir, by means of the sleeve 11 and clamp nut 12, the former being suitably embedded in the top wall of the reservoir, and the latter screwed into the sleeve.

A feed tube 13 rises from the reservoir, through the sleeve and nut, and at a suitable height departs from the vertical, as at 14, and curves outwardly and upwardly, merging into a second vertical portion 15. Above the straight portion 15 the tube is formed with a semi-circular bend 16 and at its lower end is provided with exterior screw threads 17. A casting 18 fashioned with a head 19 and counter sunk bores 20 and 21, is attached to the threaded end 17 of the feed tube by means of the threaded bore 20, and into the threaded bore 21 a second tube 22, semi-circular in form, is screwed. The free end of the tube 22 projects upwardly approximately in a direct line above the base of the feed tube 13, and its end is equipped with a nozzle 23 having the usual opening 24 for the gas jet. The head 19 of the casting 18 is bored to form a passage 25 which provides communication between the two countersunk bores 20 and 21, and thus forms a practical continuation of the two tubes 13 and 22. As clearly illustrated in Fig. 2 the casting 18 is bored out at 26 and threaded to receive the gland or packing nut 27 through which the valve stem 28 is passed. Upon the inner end of the stem 28 a needle valve 29 is fashioned which is seated in the head 19 and is adapted to regulate passage of gas or vapor through the passage 25. The outer end of the stem is equipped with a wheel 30 and threads 31, which latter are tapped into complementary threads in the cross bar 32 forming part of the frame 33, the latter being rigidly supported from the ears or lugs 34 cast integral with the casting 18.

A flat, preferably cylindrical cup or vessel 35 forms the mixing chamber for the gaseous fuel. This cup has openings 36, 36, therein through which the free ends of the feed tube 13 are passed before the tube is bent to ultimate shape. The cup is then welded to the tube forming a practically integral joint. The mixing chamber or cup 35 is located directly above the nozzle 24 of the burner and has an open center 37 surrounded by an annular flange 38 depending from the bottom of the cup 35. Upon the side walls 39 of the cup 35, are supported the

sections 40, 40 of the plate which forms the top of the mixing chamber. Each of the plate sections is provided with a central imperforate portion 41 and a foraminous area 5 42, thus providing a cover or top for the mixing chamber formed with a continuous annular portion which is perforated and opens from the interior of the mixing chamber. The central adjoining edges of the sectional plates each has a pair of complementary semi-circular recesses 43 adapted to partially surround the vertical portions of the feed tubes, and each of the sectional plates may also be provided with a screw, 10 lug, or other suitable device as 44 to furnish a handle.

A cylindrical shield 45 surrounds the essential parts of the burner. The shield is partially supported by the casting 18 and cup 35. It is recessed at 46 to fit over the casting 18, and formed with struck up tongues 47 to seat on the side wall 39 of the mixing chamber, thus providing a rigid support at three points.

25 For the initial vaporization of the liquid fuel I provide a cup 48, supported on the fuel tube and situated directly beneath the burner.

The *modus operandi* of the stove or burner 30 is as follows. The fuel reservoir is filled to nearly its capacity with hydrocarbon liquid, and the pump is then operated sufficiently to provide an air pressure in the tank or reservoir as usual. The liquid fuel is forced 35 upwardly in the feed tube 13, under air pressure, and passes through the generating channels of the feed tube to the head 19. A quantity of inflammable liquid, such as alcohol, is poured into the cup 48 and light- 40 ed. The combustion of this liquid is sufficient to vaporize the liquid fuel in the feed tube thereabove. The valve 29, which is normally closed, is now opened to the desired degree and the vaporized fuel or gas 45 is permitted to pass around the valve through passage 25 in the head 19, thence through the feed tube 22 and outwardly through the mixing nozzle 24. The heated hydrocarbon gas is forced through the nozzle and into the space within the part 35 50 through the opening 37, being mixed with air, and then passes through the perfora-

tions in the plate 40, the gas being burned as it issues from the perforations, and in this manner an intense heat is produced. 55 After the initial production of gas from the alcohol, vaporization is continued by the consumption of fuel, and a continuous source of vaporized fuel or gas is supplied through the valve. 60

From the above description, taken in connection with the drawings, it becomes obvious that I have provided a highly efficient, yet simple hydrocarbon burner, especially adapted for use as a cook stove or the like. 65 And while I have illustrated a reservoir supplying fuel under pressure, it will be understood that the essential parts of the embodied invention are applicable for use in other forms and manner. 70

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. The combination in a hydrocarbon burner, of a fuel feed tube elongated and 75 formed with a semi-circular generating channel, an extension of said tube provided with an open nozzle, a head connecting said tubes and formed with a passage therein, a valve to regulate said passage, a cup with 80 an open center located directly above said nozzle, and a plurality of sectional plates forming the cover of said cup and provided with a foraminous area.

2. The combination in a hydrocarbon 85 burner, of a fuel feed tube elongated and fashioned with a semi-circular generating channel, an extension of said tube provided with a nozzle, a head connecting said tubes and formed with a passage therein, a valve 90 to regulate said passage, a cup forming a mixing chamber secured to said feed tube and having an opening directly above said nozzle, a cover to said chamber composed of sectional plates each having a perforated 95 area, and a shield inclosing said generating channel, burner and mixing chamber, said shield having tongues resting on the walls of the mixing chamber and also supported on said head.

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Witnesses:

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