J. A. KENWORTHY.

HYDROCARBON BURNER.

APPLICATION FILED AUG. 16, 1919.

1,359,176. **Patented Nov. 16, 1920.**

Fig. 1.

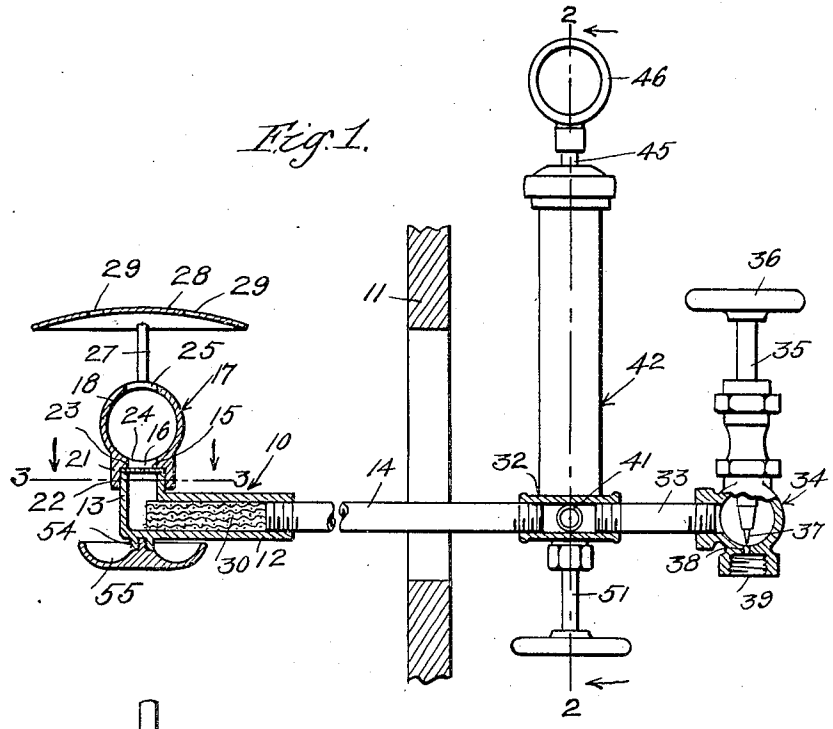


Fig. 2.

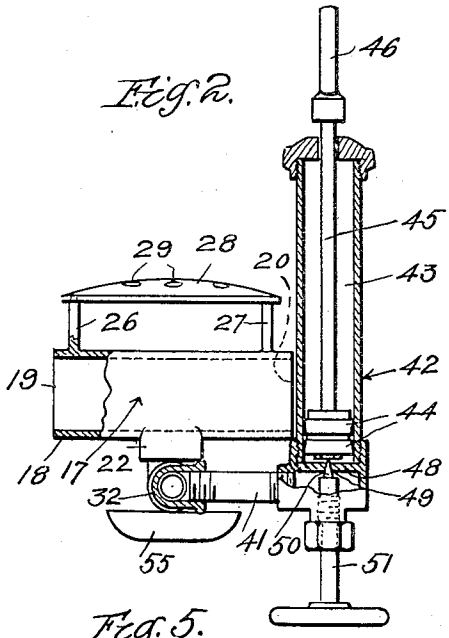


Fig. 4.

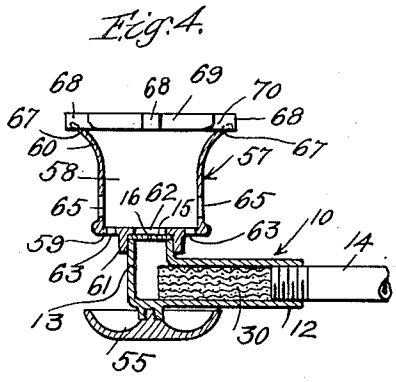


Fig. 5.

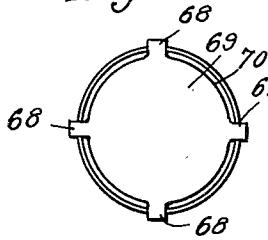
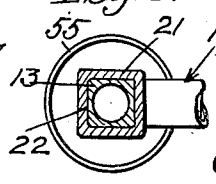


Fig. 3.



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HYDROCARBON-BURNER.

1,359,176. Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed August 16, 1919. Serial No. 318,006.

To all whom it may concern:

Be it known that I, JAMES A. KENWORTHY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention relates to liquid fuel burners, and is particularly adapted to be used in the fire boxes of ordinary cooking stoves or in hot air or water furnaces.

One object of my invention is to provide a novel means for spreading the flame from the burner, in order that the heat units may be evenly distributed throughout a considerable area, as well as directing a portion of the flame and heat created thereby on the generator and mixing chamber, whereby the fuel may be thoroughly and efficiently vaporized.

Another object of my invention is to provide a means whereby the overflow and unconsumed portion of the fuel oil may be caught and utilized for heating the generator preliminary to the starting of the burner.

A further object of my invention is to provide a novel form of mixing chamber.

A still further object of my invention is to provide a means whereby the unconsumed portion of the fuel oil remaining in the generator and pipe leading thereto, may be withdrawn therefrom, and stored away for future use after the fuel supply to the burner has been shut off, thereby avoiding the waste of said fuel oil by evaporation, as well as avoiding the danger of unconsumed oil being generated into gas and forming carbon in the burner.

I accomplish the above and other objects which will appear in the following description, by means of the burner illustrated in the accompanying drawings, in which:

Figure 1 is a vertical section through my complete burner, as it would appear when in use.

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1, viewed in the direction indicated by the arrows.

Fig. 3 is a section taken on the line 3—3 of Fig. 1.

Fig. 4 is a section through the burner and generator, showing a modified form of mixing chamber and flame spreader applied thereto.

Fig. 5 is a plan view of Fig. 4, parts which would show in the distance being omitted for the sake of clearness.

Referring more specifically to the drawings, 10 designates the generator, adapted to be projected into the fire box of a stove or furnace, the front wall of which is illustrated at 11, which comprises a tube 12 provided with an upstanding elbow 13 at one end, and has threaded into its opposite end a fuel pipe 14 which is adapted to extend outwardly to the exterior of the stove or furnace. The elbow 13 is exteriorly of rectangular formation as shown in Fig. 3, and has resting on its top surface the burner head 15, which comprises a plate provided with a centrally disposed perforation 16.

A mixing chamber 17 is adapted to be supported directly above the burner head 15, and preferably comprises a tube 18 open at both ends, as at 19 and 20, and provided with a downwardly depending centrally disposed boss 21, having a rectangular opening 22, which fits over the elbow 13, and rests upon the burner head 15, and is supported thereon by means of the shoulder 23, formed in the boss 21. An aperture 24 opens communication between the perforation 16 and the mixing chamber 17. The wall of the mixing chamber 17 is provided with an aperture 25 arranged directly above the aperture 24 and supported above said aperture, by means of standards 26 and 27 is the flame spreader 28, which comprises a dished shaped annular disk provided with a plurality of perforations 29.

Arranged in the bore of the generator 10 is a coil of wire gauze or similar material 30, which serves to break up the fuel into minute particles and aid in the vaporizing of the same.

The free end of the pipe 14 is threaded into a T fitting 32 and the end of a piece of pipe 33 is threaded into said fitting opposite the pipe 14 and has threaded onto its outwardly extending end the needle valve 34, said valve comprising the valve stem 35, handle 36, needle point 37, seat 38 and inlet opening 39, through which the fuel oil passes through a suitable pipe connection leading from a source of supply (not shown).

At right angles to the pipes 14 and 13 and between the same, a piece of pipe 41 is threaded into the fitting 32, the opposite end of said pipe being threaded into the lower portion of a pump 42, said pump compris-

ing the barrel 43, the piston 44, the piston rod 45, and handle 46. The pump 42 is provided with the bottom 48 having the seat 49, adapted to receive the needle point 50 of the valve 51, said valve being adapted to open and close communication between the barrel 43 of the pump and the pipe 41, as clearly shown in Fig. 2 of the drawings.

Threaded into a boss 54 on the lower surface of the tube 12, is a firing-pan 55 arranged below the generator and adapted to be filled with oil in order that the generator may be heated preliminary to starting the burner.

In Figs. 4 and 5 I have illustrated a modified form of mixing chamber and flame spreader and deflector, adapted to coöperate with the same style of generator and burner head as illustrated in Fig. 1. The mixing chamber 57 comprises a tubular structure 58 provided with the bottom 59 and the flared wall 60 at its top. The bottom 59 is provided with a boss 61, similar to the boss 21 having an opening adapted to fit over the burner head in a similar manner to that illustrated in Fig. 1. The bottom 59 is provided with the aperture 62 adapted to register with the perforation 16; and with a plurality of openings 63, communicating with the atmosphere.

The wall of tube 58 is provided with a pair of oppositely disposed openings 65, arranged adjacent the bottom 59 adapted for the admission of air into the mixing chamber.

The top rim of the flared portion of chamber 57 is provided with a plurality of notches 67 adapted to receive the projections 68 of a spreader plate 69, said spreader plate being of slightly smaller diameter than the diameter of the top of chamber 57, thus leaving an annular passage 70 for the passage of the flame.

In the operation of my burner, the burner head may be provided with legs or supports (not shown) so that the burner may be supported in the range or furnace in the desired position. The valve 34 is then opened as shown in Fig. 1, to admit the fuel to the generator, the valve 51 leading to the pump being at this time closed. The oil in the firing-pan 55 is then lighted to heat the generator to vaporize the fuel passing therethrough. When sufficient gas has been generated a match is applied at the opening 25 of the preferred form or the passage 70 of the modified form of mixing chamber. The flame is spread by the disk 28 and deflected onto the generator sufficiently to keep it hot, part of the flame being allowed to pass through the perforations 29, thus distributing the flame and heat over a considerable area. Air from the atmosphere is drawn in through the open ends 19 and 20 of the mixing chamber 17 by the action of the gas and is mixed with the vaporized fuel.

When the burner is shut off by closing the valve 34, a certain amount of the ungenerated oil remains in the generator and pipes 14 and 41, which would become wasted and befoul the burner and emit an offensive odor. In order to conserve this oil and prevent the odor therefrom, the valve seat 49 is then opened and the piston 44 drawn upwardly, thus sucking all of the surplus oil up into the pump barrel and holding it there to be used in recharging the generator when it is again desired to start the burner.

In the modified form as illustrated in Fig. 4, the air enters the chamber 58 where it is mixed with the gas issuing from the burner tip 16, the flame impinging against the plate 69 is forced downwardly through the apertures 63 onto the generator, a portion of the flame passing through the annular passage 70 is spread into a large circular flame.

What I claim is:

1. A gas generator construction, comprising a generator having a source of fuel supply leading thereto, means for controlling said fuel supply, and a suction mechanism interposed between said generator and fuel controlling means, whereby the unconsumed oil may be withdrawn from said generator.

2. A gas generator construction, comprising a generator having a fuel supply pipe leading thereto, a valve for controlling the supply of fuel through said pipe to said generator, a pump interposed between said generator and supply controlling valve, and a second valve adapted to open and close connection between said first mentioned valve and said generator.

In witness that I claim the foregoing I have hereunto subscribed my name this 7th day of August, 1919.

JAMES A. KENWORTHY.