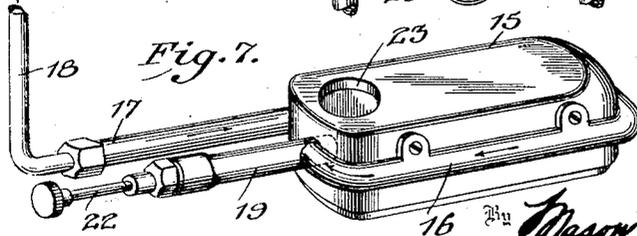
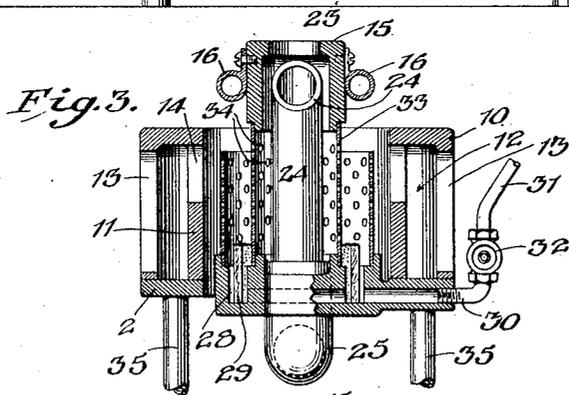
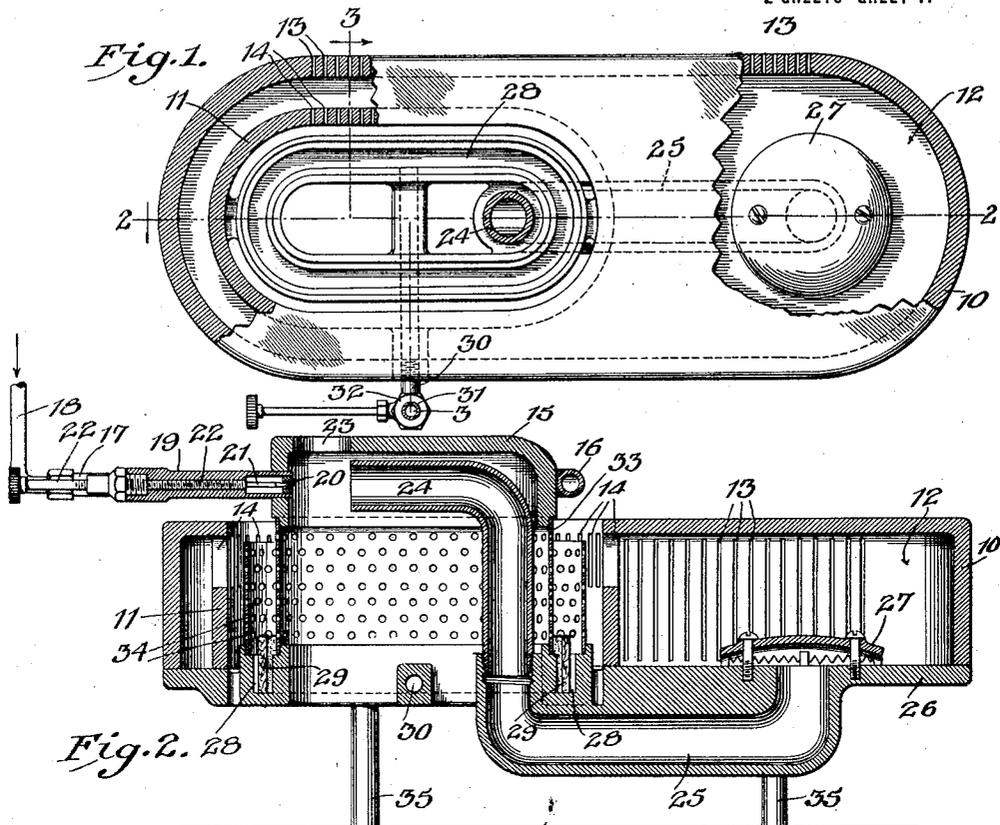


D. H. BRAZIL.
 FLUID FUEL BURNER.
 APPLICATION FILED APR. 8, 1919.

1,329,224.

Patented Jan. 27, 1920.

2 SHEETS—SHEET 1.



Inventor

David H. Brazil

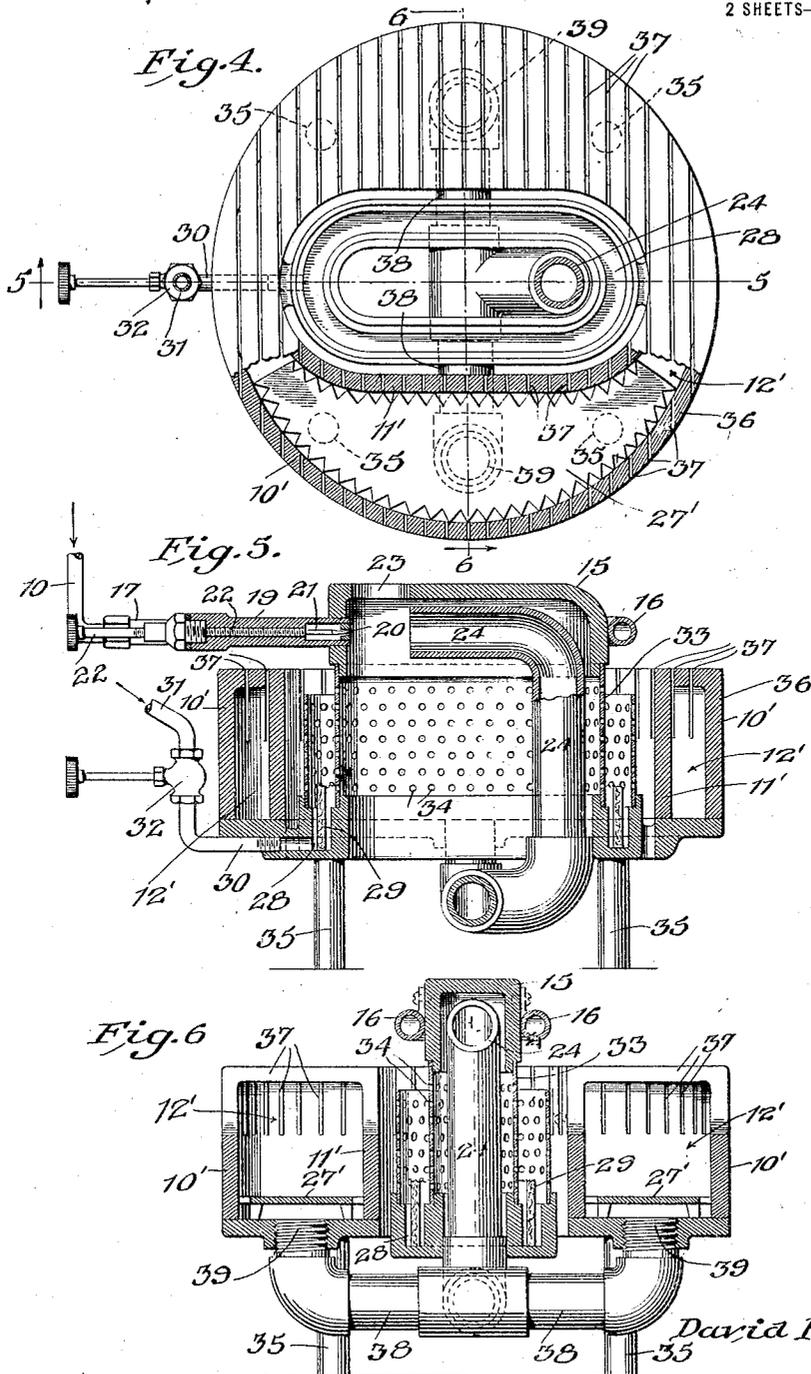
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UNITED STATES PATENT OFFICE.

DAVID HARTWELL BRAZIL, OF MONTGOMERY, ALABAMA.

FLUID-FUEL BURNER.

1,329,224.

Specification of Letters Patent. Patented Jan. 27, 1920.

Application filed April 8, 1919. Serial No. 288,603.

To all whom it may concern:

Be it known that I, DAVID HARTWELL BRAZIL, a citizen of the United States, residing at Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Fluid-Fuel Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to fluid fuel burners and has for an object to provide a burner of improved type adapted for burning hydrocarbon fluid fuel of various tests but corresponding substantially with the fluid fuel ordinarily marketed under the name kerosene.

A further object of the invention is to provide a fluid fuel burner having improved form of gas generating apparatus and combustion apparatus.

A further object of the invention is to provide in a fluid fuel burner an improved type of apparatus for initial heating of the generator providing convenience and expedition in such initial generation.

A further object of the invention is to provide a fluid fuel burner capable of being produced in a variety of shapes, forms and sizes to correspond to the use to which it is to be applied without change of the generating apparatus or change of general form or type of ignition apparatus.

With these and other objects in view the invention comprises certain novel construction, combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings,

Figure 1 is a top plan view of the improved fluid fuel burner with certain parts removed and with parts broken away to show the internal construction.

Fig. 2 is a longitudinal sectional view throughout the burner as indicated on line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view through the burner as indicated by line 3—3 of Fig. 1.

Fig. 4 is a top plan view of a circular or round type of burner, certain parts being broken away and other parts being removed for the purpose of showing the internal construction.

Fig. 5 is a diametrical sectional view

through the round type of burner taken on line 5—5 of Fig. 4.

Fig. 6 is a diametrical sectional view through the round type of burner taken at right angle to the plane of Fig. 5 and as indicated by line 6—6 of Fig. 4.

Fig. 7 is a perspective view of the generator applicable to any form, type or size of burner.

Like characters of reference indicate corresponding parts throughout the several views.

The improved type of burner which forms the subject matter of this application, can be and preferably will be made in any form or shape to occupy the requisite or desired amount of space within any usual and ordinary type of heating or cooking apparatus such as cook stoves, ranges, heating stoves, furnaces, fireplaces and the like, and the shape, size and general configuration will depend upon the heating appliance into which it is to be placed.

As shown at Figs. 1, 2 and 3, the burner is shown oval or elliptical in plan, intended to fit into the firebox of a cook stove or range of the usual and ordinary construction and build. At Figs. 4, 5, and 6, the burner is shown circular or round in plan intended to fit into circular heating stoves or under-water heaters or into some specially prepared casing to set into a fireplace or the like.

It is obvious that while an elliptical or oval shape has been shown as one type and a circular or round shape has been shown as another type, the device may be made in various other types and shapes as may be found necessary or desirable to conform to the requirements for such a burner.

Like characters of reference will indicate corresponding parts as far as possible throughout the several views.

As shown at Figs. 1, 2 and 3, an oval or elliptical body 10 is provided having properly situated therein and preferably adjacent one end an oval or elliptical chamber formed by a partition 11. The chamber 12, between the outer wall 10 and the inner partition 11 is the mixing chamber whereby the oxygen of the air is thoroughly and finally mixed with the vaporized hydrocarbon fuel and when so mixed the gaseous mixture is discharged through any convenient or ordinary type of gas discharge openings, here indicated as slots 13, which slots may extend

throughout as great a portion of the outer wall 10 as may be found desirable or convenient depending upon the type of heating apparatus in which the burner is to be inserted. It is also obvious that if slotted only upon the longitudinal side it is not necessary that the slottings upon one side correspond to the slottings upon the other, as the type of heating apparatus may make it desirable to discharge a greater amount of heat or flame upon one side of the burner than upon another.

The partition 11 is also provided with gas outlets shown in the drawings as slots 14 for the purpose of projecting a flame within the oval or elliptical chamber formed within the partition 11 to vaporize the fluid fuel as hereinafter more fully described.

Above the chamber included within the partition 11 is located the generator which comprises a cap member 15 surrounded by a tubular retort 16 in position to receive the flame from the openings 14. The retort 16 is continued into an inlet pipe 17 which is fed from any convenient source of fuel supply through the usual and ordinary semiflexible tubing 18, known in the art as "hollow wire." Any desired or convenient forms of valves, stop-cocks or the like, for the control of the flow of fluid through or from the tubular conduit 18, may be supplied and are not here shown.

The tubular retort 16 curving about the cap 15 terminates in a branch 19 which branch communicates with the interior of the cap 15 by gas discharge orifice 20 and with a needle valve 21 positioned to vary the capacity of the orifice 20 and close the same when found desirable, such needle valve being controlled by any usual or ordinary manual means as the stem 22.

The fluid fuel within the retort 16 subjected therefore to the flame projected through the openings 14 is gasified or vaporized and discharged through the gas orifice 20 above which is located an air inlet duct 23 in the cap 15 for the purpose of taking in air to support combustion of the gas discharged through the orifice 20.

A conduit and initial mixing chamber for taking the gas and admixed air from the orifice 20 and discharging it into the chamber 12 is provided in form of a pipe 24 in axial alinement with the discharge orifice 20 whereby the gas discharged from such orifice is directed directly into the tubular conduit 24 commingling with the air from the opening 23 and from below through the inner chamber and performing an initial mixing in such conduit 24.

To conduct the combined gases and air from the curved conduit 24 into the chamber 12, a conduit 25 is provided communicating at one end with the conduit 24 and at the other end with the chamber 12. Preferably,

although not necessarily, this conduit 25 is cast integral with some part of the housing, which in turn may be formed as a unitary structure or the part 26 may be formed as a cover member fitting upon the bottom edges of the walls 10 and 11. It is to be understood that the construction of the conduit 25 as integral or unitary with the housing is not important to the present invention and the same may be formed in any usual or ordinary manner.

Within the housing 12 and over the outlet end of the conduit 25, a baffle 27 is erected whereby the combined gas and air emerging from the conduit 25 is spread out and directed to various portions and parts of the chamber 12 thereby insuring a better mixing and a better distribution of the combustible gases for discharge through the openings 13 and 14 for the purposes noted. The baffle 27 may be of any usual and ordinary construction but is preferably provided bowed as indicated more particularly at Fig. 2 and with serrated edge whereby the gas emerging from beneath such baffle is broken up into small jets thereby adding to the efficiency of the mixing.

To provide for an initial heating of the retort 16 and an initial gasification of the fluid fuel contained therein a well 28 is provided having a wick 29 disposed therein. Oil is supplied to the well 28 in any approved manner as being poured directly into such well when found desirable but preferably it is supplied by means of a conduit 30 having communication with a semiflexible tube 31 also of the type known as hollow wire and the flow controlled in any approved manner as by the use of the valve 32. Within the well 29 and conforming substantially to the shape of the well 28, a perforated metal plate 33 is erected which it is found convenient to employ also as a support for the cap 15. Externally about the wick 29 is also erected a perforated metal plate 34 between which two perforated plates the flame supported and supplied from the wick 29 emerges supplied with oxygen through the perforations of the plates and into engagement with the retort 16. The supplying of air through the perforations of the plates 33 and 34 produces an odorless blue flame emerging from between such plates into engagement with the retort 16 whereby odors and carbonization is wholly or to a great extent eliminated.

As the type shown at Figs. 1 to 3 inclusive is intended to set into the firebox of a cook stove or range it is desirable to supply the device with supporting structure such as the legs 35, although it is to be understood that the legs form no part of the present invention and are adapted to be employed or substitutes therefor as the supporting of the device may make desirable.

In the round type of burner as shown in Figs. 4 to 6 inclusive, the usual use of such burner would make it desirable that the flame issuing from the housing should be projected at least the major portion of the same upwardly. For that reason the housing 36 is provided with combustion openings in the top here shown as slots 37, which for the purpose of spreading the flame and also of producing flame in position to impinge upon the retort 16 is preferably cut entirely across and down a certain distance through the wall 10' and partition 11' whereby in addition to the flame being projected wholly upwardly permits a certain percentage of the flame to spread outwardly and inwardly to produce the largest flame area possible in the structure.

Also in the matter of distributing and conducting the gas and air mixture from the gas orifice 20 to the chamber 12' it is desirable that the conduit section 24 communicate with branched conduit sections 38 having two inlets at 39 to the chamber 12' discharging under baffle plates 27' which are made of such form as to conform to the space in which they are employed, here shown as approaching crescent shape and are provided with the serrated edges for the purpose of assisting in the distribution of the air and gas.

In either type the operation is as follows:

To start the device the fluid fuel is admitted to the well 28 surrounding and impregnating the wick 29. Fire is applied to the wick 29 in the usual and ordinary manner and the flame supported by the consumed fluid fuel passes upwardly between the plates 33 and 34 impinging against and into contact with the retort 16 whereby such retort is heated and the fluid fuel content gasified. Experience will indicate the length of time it is necessary to support this initial heating flame in contact with the retort and as soon as such time has elapsed the gas will be discharged from the gas orifice 20. This may be controlled when found desirable by manipulating the stem 22 and needle valve 21 although such needle valve may be left open and the gas will be discharged from the gas orifice when it has been produced and will be lighted from the flame supported upon the wick 29. It is obvious that as soon as the fluid fuel in the well 28 has been consumed the flame supported by the wick 29 will expire and needs no further attention.

The gas once generated and being discharged from the gas orifice 20 will pass together with the air taken up thereby into the mixing conduit 24 and passing through such conduit and the conduit 25 or in the circular type the conduit 38, will be discharged into the chamber 12 or 12' and will

be discharged therefrom through the openings 13 or 37 where the flame and heat is generated and supported.

While in the drawing the housing is shown as constructed in two parts, it is obvious that if found convenient it may be constructed as an integral structure.

It is also obvious that by reason of the construction and arrangement of the cap 15, air is supplied to mix with the gas from the gas orifice 20, not only from above through the opening 23 but also from below through the open structure of the housing. Air is therefore supplied upon all sides of the jet of gas issuing from the orifice and commingled therewith thoroughly and in large quantities before such commingled gas and air enters the mixing conduit 24.

Also by reason of the construction and arrangement of the mixing conduits 24 and 25 the housing becomes practically self containing or the burner is practically completely located within the housing, for while it is true that the conduit 25 extends under the housing it does not enlarge or extend beyond the lines of the housing whereby the housing can be placed in a fire box corresponding to the shape of the housing and no pipes extend externally to interfere with such proper placing.

Also by locating the retort 16 in a substantially U-shaped curve about and attached to the cap 15, the said retort is in position to receive flame from the wick 29 curved to occupy a minimum space within the housing so that the said initial ignition device is also contained within the housing and not externally thereof and providing means for producing a blue flame from hydrocarbon oil such as petroleum without carbonization or smoking and eliminating the necessity of using alcohol or similar fluid for initial vaporization.

The use of the fuel well 28 and its supply tube also eliminates the necessity of pouring the initial ignition fluid into the structure in any manner as from a can or the like, and thereby eliminates absolutely the possibility of explosion or igniting of the fluid fuel in an open vessel to the danger or the damage of the user.

I claim:

1. A fluid fuel burner comprising a housing having a plurality of gas egress ports, some of which are directed toward each other, a retort located above the housing and in position to receive flame from the inwardly directed egress ports and a conduit positioned within the housing adapted to receive gas from the retort and conduct it from a point above the housing downward centrally through said burner to and discharge it into the bottom of the housing.

2. A fluid fuel burner comprising a housing having gas egress ports, a walled open-

- ing extending vertically through the housing, a retort located above said walled opening, some of the said gas egress ports being directed toward the retort, a gas conduit located within the walled opening and positioned to conduct a gaseous mixture and discharge it into the bottom of the housing, the said retort being provided with a gas orifice in alinement with the opening of the gas conduit and a cap covering the gas orifice and adjacent end of the gas conduit and providing means for supplying air to commingle with the gas as discharged from the gas orifice.
3. A fluid fuel burner, comprising a housing, a walled opening extending vertically throughout the housing, a cap covering a part of the walled opening, a retort formed in the shape of a tube surrounding a part of the cap and arranged to discharge into the cap, a gas conduit having an inlet port located within the cap and in substantial axial alinement with the gas discharge, said conduit communicating with the housing and means for supporting and directing a heating medium toward the retort.
4. In a fluid burner, the combination of a housing, a retort above said housing, a conduit for mixed vaporized fuel and air, the said conduit in alinement with the nozzle of said retort, and intervening air inlet chamber between said nozzle and said conduit, the said mixing chamber having an air inlet from above and the said conduit extending U-shaped into said housing, and a baffle at the opening of said conduit into said housing.
5. In a fluid fuel burner, the combination of a kerfed housing, a retort above said housing, a conduit for mixed vaporized fuel and air, the said conduit in alinement with the nozzle of said retort, an intervening air inlet chamber between said nozzle and said conduit, a detachable baffle at the opening of said conduit into said housing.
6. In a fluid fuel burner, the combination of a kerfed housing, a detachable retort above said housing, a U-shaped mixed fuel and air conduit in alinement with the nozzle of said retort, and an air inlet chamber between the nozzle of said retort and said conduit, the said mixing chamber being open at the top and bottom.
7. In a fluid fuel burner, the combination of a housing, a retort above said housing, a conduit for mixed air and fuel, an air inlet chamber between said conduit and the nozzle of said retort, a cap for said chamber being surrounded by a tube, the said tube forming said retort.
8. In a fluid fuel burner, the combination of a housing containing combustion and mixing chambers for gaseous fuel and a wick and reservoir for liquid fuel, and a conduit for mixed fuel and air entering the top of said housing and passing downward centrally to the bottom of said housing and entering said mixing chamber.
9. In a fluid fuel burner, the combination of a housing containing combustion and mixing chambers for gaseous fuel and a chamber for heating air before mixing, the cap to said air heating chamber encircled by a retort, the said retort having a nozzle directed through said air heating chamber and into a tubular conduit for mixed fuel and air.
10. In a fluid fuel burner, the combination of an outer mixing chamber and an interior chamber for burning liquid fuel, and a cap for said interior chamber, said cap surrounded by a retort.

In testimony whereof I affix my signature.
 DAVID HARTWELL BRAZIL.