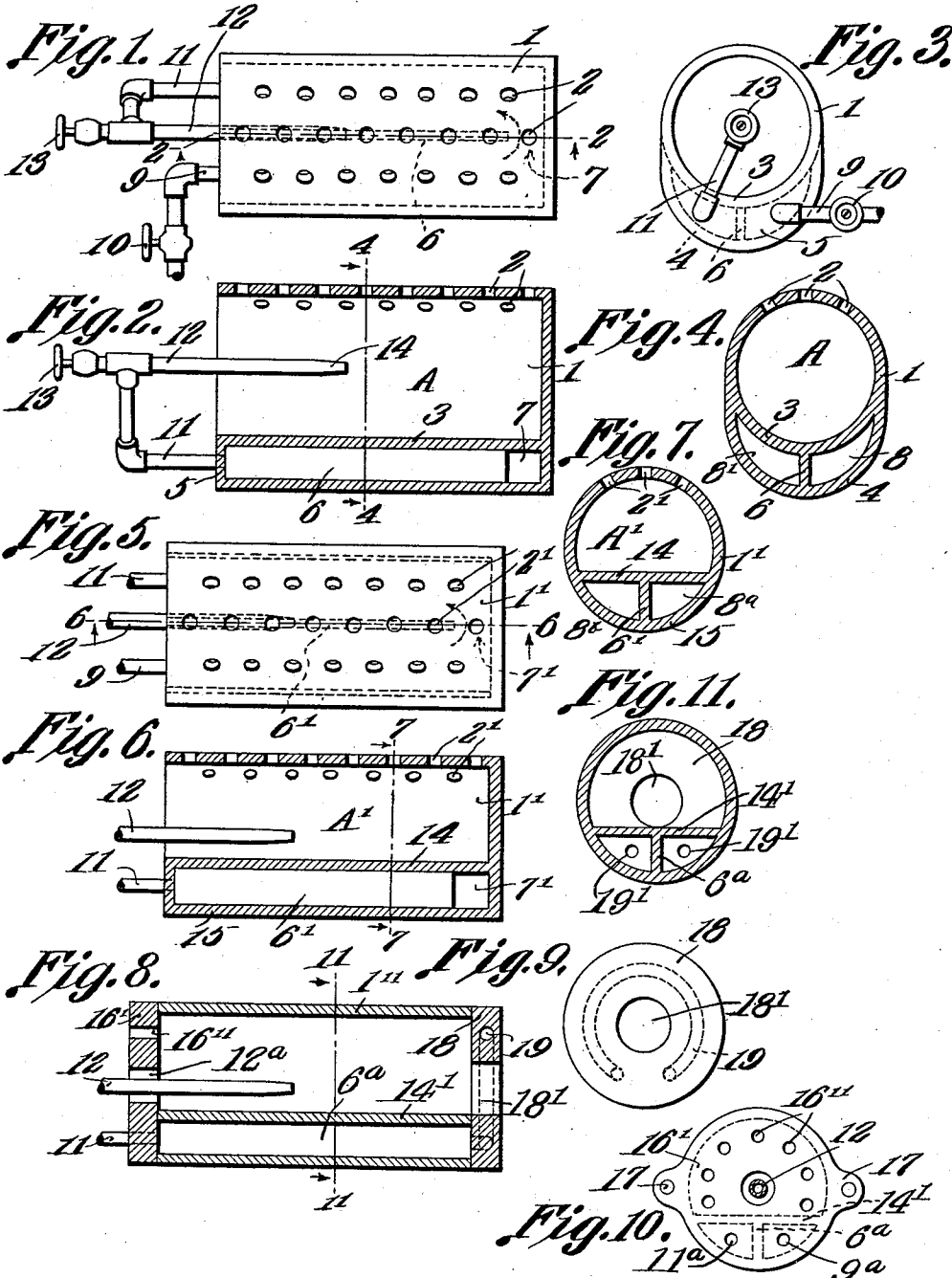


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FLUID HYDROCARBON BURNER.
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1,033,079.

Patented July 23, 1912.



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UNITED STATES PATENT OFFICE,

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FLUID-HYDROCARBON BURNER.

1,033,079.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE E. BENTON, a citizen of the United States, residing at Amagansett, in the county of Suffolk and State of New York, have invented a new and useful Fluid-Hydrocarbon Burner, of which the following is a specification.

This invention relates to improvements in fluid-hydro-carbon burners, the primary object of the invention being the provision of a burner, wherein heavy fuel oils may be employed, the said oils being vaporized and supplied to a combustion chamber in the form of vapor, thus dispensing with the necessary apparatus generally employed in atomizing hydro-carbon fluid to produce an efficient burner.

A further object of this invention is the provision of a horizontally disposed vaporizing chamber, into which leads the oil supply pipe, the same being heated to vaporize the oil, and to carry the same in the form of vapor away therefrom, into a combustion chamber, where the air may be supplied to said vapor to the desired degree.

A still further object of this invention is the provision of a hydro-carbon burner, especially adapted for burning oils of a low specific gravity that is from 25 to 30 degrees, the same vaporizing the said oils for use upon various forms of furnaces and boilers, but especially for hot water, hot air, steam furnaces, and for locomotives and marine boilers. This particular form of burner is also especially adapted for metallurgical purposes and for forging, the same being adapted for use in the various forms of blast and smelting furnaces, dispensing with the employment of the necessary steam and compressed air plants, for atomizing such low grade oils.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a top plan view of one form of burner. Fig. 2 is a longitudinal section taken on line 2—2 of

Fig. 1. Fig. 3 is an end view of the burner. Fig. 4 is a cross section taken on the line 4—4 of Fig. 2. Fig. 5 is a top plan view of a modified form of burner. Fig. 6 is a longitudinal sectional view taken on the line 6—6 thereof. Fig. 7 is a cross section taken on line 7—7 of Fig. 6. Fig. 8 is a longitudinal sectional view of another modified form of burner. Fig. 9 is a rear end view thereof. Fig. 10 is a front elevation of the burner shown in Fig. 8. Fig. 11 is a cross sectional view taken on the line 11—11 of Fig. 8.

Referring to the drawings, the numeral 1 designates in Figs. 1, 2, 3 and 4 a cylindrical casing, which is provided at its dome portion throughout its length with a series of burner outlets 2, and with the lower wall 3. Secured to the lower portion of the casing 1 below the same is the crescent shaped vaporizing chamber 4, which is provided with the forward closed end 5 and with the longitudinally disposed partition or wall 6, which divides said chamber into the inlet chamber or compartment 8, the communicating passage way 7 and the gas conducting chamber 8'. The heavy oil is admitted preferably by gravity, through the inlet pipe 9 controlled by the valve 10, into the forward end of the vaporizing compartment 8, the vaporizing chamber 4 and casing 1, having been super-heated by the use of an igniting fluid such for instance as gasolene or kerosene, before the heavy oil is permitted to flow into the compartment of the chamber 4. The low grade oil entering into the compartment 8, and being subjected to the heat therein, vaporizes and passes through the channel or passage way 7 into the compartment 8', thence through the pipe 11 into the burner pipe 12, which is controlled by the needle valve 13, so that the gas or vapor thus formed is admitted into the chamber A of the casing 1 where the same is ignited and the flames pass through the openings 2 thereof. By this means it will be seen that the chamber 4 converts the liquid fuel into a vapor and that this vapor by reason of its expansion is forced through the pipe 11 and burner 12 into the chamber A, the chamber A being open at its inner mouth so that the vapor creates a suction of air, to cause complete combustion of the hydro-carbon gas thus generated.

In the form shown in Figs. 5, 6 and 7,

the cylindrical casing 1' is provided with the usual flame outlets 2', but instead of adding a vaporizing chamber thereto, a longitudinal horizontally disposed partition 14 is mounted in the cylinder, and with the lower portion 15 of the cylinder, provides the vaporizing chamber in this form of burner, the partition 6' being mounted centrally and longitudinally thereof so as to provide the two compartments 8^a and 8^b, and the passage way 7'. In this form it will be seen that the inlet 9 feeds the fluid hydro-carbon to the compartment 8^a where it is acted upon and vaporized the same as in the other form of burner, passing around through the passage way 7' into the compartment 8^b to the pipe 11 and burner 12, the same being controlled by the usual valve 13, while the pipe 9 is controlled by the valve 10. In this way the oil is vaporized and conducted to the compartment A' of this form of burner where complete combustion is had.

In the form of burner shown in Figs. 8, 9, 10 and 11, a cylindrical casing or tube 1'' is provided, the straight partition wall 14', having the vertical and longitudinal web 6^a providing two chambers, the rear end of the inlet chamber being in communication with the port 19' of the open ring channel 19 provided in the head 18 of the burner, the said head 18 being provided with the concentric opening 18' in line with the burner opening 12^a in the other head thereof. From this construction, it will be seen that the oil is admitted into the right hand side of the vaporizing chamber at the port 9^a and enters the port 19' of the channel 19 and passes out of its other port 19'' into the other chamber and is fed to the burner through the port 11^a as in the other casing. The front head of this burner is provided with a series of air inlet apertures 16'', the oppositely disposed lugs 17 being provided to properly support and hold the burner in use.

From the foregoing description it will be seen that all forms of burners constructed according to this invention, can be operated without the aid of steam or compressed air, the oil being supplied by gravity from an elevated tank, or in case this condition cannot be had, by a tank operated by compressed air, or like agent.

In using this burner the casings 1 and 1' are heated by a torch or by saturation with kerosene or gasoline in a small receptacle located below the burner. After thus being heated, the fluid hydro-carbon is turned on as desired through the pipe 9, and as the burner itself is of such a temperature, the oil passing into the vaporizing chamber of the burner will readily vaporize and be finally fed under its own expansive pres-

sure, to the burner 12 within the burner or combustion chamber thereof. By this means complete combustion without smoke may be had, and a burner for burning very low grade or low specific gravity oil is provided.

What is claimed is:

1. A fluid hydro-carbon burner, comprising an open ended combustion chamber, provided with means for the emission of the flame, a vaporizing chamber of the same length as but of a less vertical height and cross-sectional area than the combustion chamber, disposed below the combustion chamber, a partition in said vaporizing chamber dividing said chamber into two longitudinal and parallel compartments in communication with each other at their rear ends, a fluid fuel inlet at the forward end of one of said compartments, a gas nozzle projecting into the combustion chamber, and a gas outlet at the forward end of the other compartment of the vaporizing chamber leading to the nozzle.

2. A fluid hydro-carbon burner, having a casing provided with a series of flame outlet apertures in the upper portion thereof, said casing forming a combustion chamber having one open end, a vaporizing chamber of substantially the same length as the combustion chamber, located below the combustion chamber, a longitudinally disposed partition dividing the vaporizing chamber into two communicating compartments, a liquid fuel supply pipe to one compartment of the vaporizing chamber, a gas nozzle projecting in the open end of the combustion chamber, and a gas supply leading from the other compartment of the vaporizing chamber to the nozzle.

3. A fluid hydro-carbon burner, having a longitudinally disposed combustion chamber provided with a series of flame outlets in the upper part thereof, and with an open end, a vaporizing chamber of substantially the same length but of less area than the combustion chamber disposed below the combustion chamber, a longitudinally disposed partition dividing said vaporizing chamber into two communicating compartments, a fluid fuel inlet connected with one of the compartments of the vaporizing chamber, a gas nozzle projecting into the combustion chamber, and a gas conduit leading from the other compartment of the vaporizing chamber to the nozzle.

4. A fluid hydro-carbon burner, comprising an open end combustion chamber provided with a series of flame outlets, a vaporizing chamber of substantially the same length but of less area than the combustion chamber disposed below the combustion chamber, a partition in said vaporizing chamber, dividing said chamber into two

longitudinal and parallel communicating
compartments, a fluid fuel inlet for one of
said compartments, a gas nozzle projecting
into the combustion chamber, and a gas out-
5 let to the other compartment of the vapor-
izing chamber, leading to the nozzle.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signa-
ture in the presence of two witnesses.

GEORGE E. BENTON.

Witnesses:

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