W. F. DREW.

LIQUID HYDROCARBON BURNER.

APPLICATION FILED DEC. 5, 1913.

1,130,073. Patented Mar. 2, 1915.

Fig. 2.

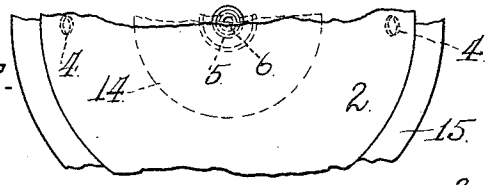


Fig. 1.

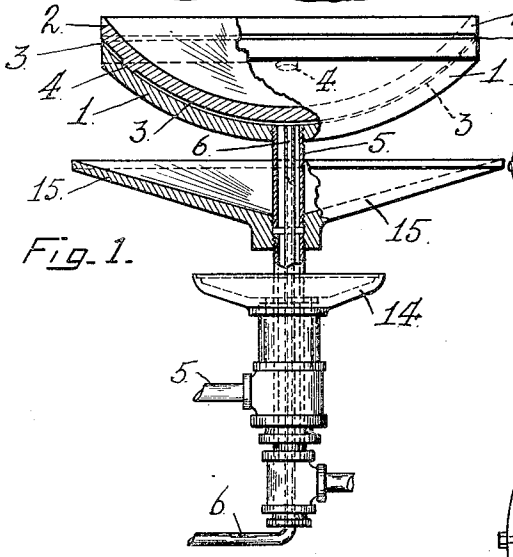


Fig. 7.

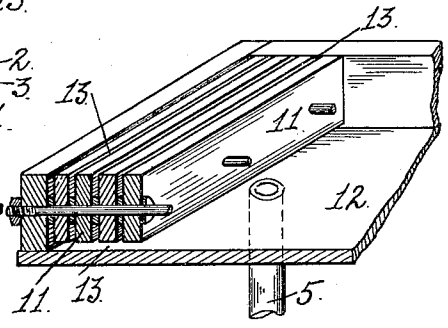


Fig. 6.

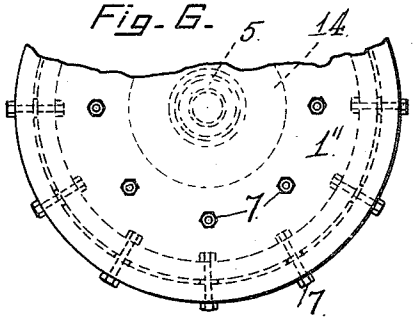


Fig. 4.

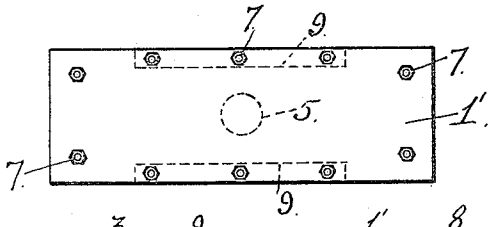


Fig. 3.

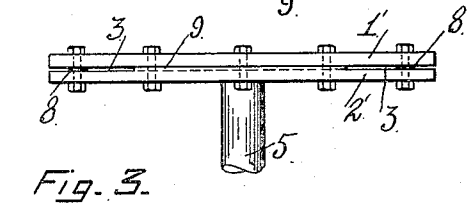
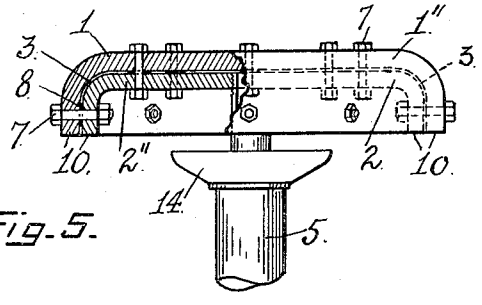


Fig. 5.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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LIQUID-HYDROCARBON BURNER.

1,130,073. Specification of Letters Patent. **Patented Mar. 2, 1915.**

Application filed December 5, 1913. Serial No. 804,809.

To all whom it may concern:

Be it known that I, WILLIAM FRANKLIN DREW, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Liquid-Hydrocarbon Burners, of which the following is a specification.

My invention relates to the class of liquid-hydrocarbon burners.

It has for its object the two-fold purpose of thoroughly atomizing the fuel and of scouring the surfaces over which it passes, so that no deposit of carbon results; and to this end my invention consists in the novel hydrocarbon burner which I shall now fully describe, by reference to the accompanying drawings in which—

Figure 1 is a view, partly in section and partly in elevation, of my burner. Fig. 2 is a broken plan of the same. Fig. 3 is an elevation of my burner, showing a slight modification in the shape of the heat-conducting vaporizing plates. Fig. 4 is a plan of the plates of Fig. 3. Fig. 5 shows another modification of the shape of the plates. Fig. 6 is a broken plan of the same. Fig. 7 is a broken perspective view showing still another modification of the vaporizing plates, with respect both to their shape and relative arrangement.

Referring first to Figs. 1 and 2, I employ two heat-conducting plates 1 and 2, said plates being in this case, for the sake of illustration, shown in the form of dished disks, one lying within the other. These plates are separated by a space 3, to which the hydrocarbon and the atomizing agent are supplied centrally, and at the perimeter of which the gases issue and are ignited. This space 3 with respect to its width must be such as will effect the double purpose of thoroughly atomizing the fuel and of increasing the velocity of the fluids through it in order to scour the opposing plate surfaces. I shall therefore designate it by the term thin, using this word in its primary significance of having opposite surfaces close or near together, and I may further attempt to define it by saying that said space may be as thin as 25/10000 of an inch, though I have found in practice that 2/100 of an inch gives excellent results. I do not, however, confine myself to these dimensions, as good results may be had even above said 2/100 of an inch. It must also be understood that the illustration of this space, here given by the double lines, is necessarily an exaggeration, as it cannot be otherwise shown. The thinness of this space may also be further defined, as I have already indicated, by the expression of its function, which is to produce a thorough mingling of the atomizing agent or fluid, which may be steam or air, with the liquid hydrocarbon to atomize the latter, and at the same time to effect an increase in the velocity of the fluids through said space to the end that the surfaces bounding it may be thoroughly and constantly scoured and thus a deposition of carbon prevented, whereby it results that the burner is self-cleansing and will not choke up. This separation of the heating or vaporizing plates 1 and 2 may be effected and maintained in any suitable manner. For illustration I have in Figs. 1 and 2 shown the upper plate 2 as resting by its own weight in the lower plate 1, and separated therefrom by small bosses 4. The plates are to be located within the chamber to be heated, and the perimeter of the space 3 between said plates is open and free, the ignition of the gases taking place at this perimeter. The liquid-hydrocarbon and the atomizing agent or agents are supplied to the space 3 in its axis. To indicate this I have shown the pipe 5 for the oil and the pipe 6 for the atomizing agent.

In Figs. 3 and 4, I show the heat conducting plates 1′ and 2′ as flat rectangular plates, and as being secured together by bolts 7, the separation of the plates being shown as effected by washers 8 and thin bosses 9.

In Figs. 5 and 6 I show the heat conducting plates 1″ and 2″ as circular and having their rims down-turned at 10. These and many other modified shapes are obviously possible.

In Fig. 7, I show bars 11, above a bottom plate 12, these parts being separated by the necessary thin spaces 13.

In operation the oil and the atomizing agent are forced through the thin space between the vaporizing plates, to the end that not only shall thorough atomization take place, but also that by an increase in velocity due to the thinness of the space, the adjacent plate surfaces shall be scoured and kept clean of carbon deposit.

Any suitable means may be employel to initially heat the plates. For the sake of

illustration—I have shown in Fig. 1 an underlying gas burner 14. Between the burner and the vaporizing plates is a bowl 15. In starting the burner, oil and water are allowed to drip into the bowl 15. The burner 14 being lighted, the bowl 15 is heated and its contents becoming ignited heat the vaporizing plates. During operation, if any liquid drip takes place from the space 3 into the bowl, due to a decrease in vaporization, this drip will ignite and again heat the plates.

I claim:—

1. A liquid hydrocarbon burner comprising superposed heat conducting vaporizing plates, the opposing faces of the plates being separated to such a slight degree from each other and equally throughout the same as to provide a thin mixing and atomizing space between and extending substantially throughout the entire opposing faces of the plates, whereby atomization and increase of velocity of the fuel passed through the space between the plates is effected, one of said plates having an opening extending through the same and the opposing surface of the other plate directly opposite said opening being spaced therefrom and extending at the opposite side of said space, and means for introducing liquid hydrocarbon and atomizing fluid through said opening of one of the plates into the thin mixing and atomizing space between the plates and against the spaced opposing face of the other plate.

2. A liquid hydrocarbon burner comprising superposed heat conducting vaporizing plates, the opposing faces of the plates being separated to such a slight degree from each other and equally throughout the same as to provide a thin mixing and atomizing space between and extending substantially throughout the entire opposing faces of the plates, whereby atomization and increase of velocity of the fuel passed through the space between the plates is effected, and means for introducing liquid hydrocarbon and atomizing fluid separately through one of the plates and against the other plate into the thin mixing and atomizing space between the plates and centrally thereof, the mixture issuing from between the plates at their outer edge portions.

3. A liquid hydrocarbon burner comprising superposed concavo-convex heat conducting vaporizing plates, said plates being disposed in nesting relation, means for introducing liquid hydrocarbon and atomizing fluid separately through the concave face of one plate and projecting the same against the convex face of the other plate, and means spacing the plates to a degree whereby atomization takes place and the velocity of the fuel toward the edges of the plate is increased the fuel being emitted from between the plates at their edge portions.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM FRANKLIN DREW.

Witnesses:

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D. B. RICHARDS.

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