A. KAUFMAN.

HYDROCARBON BURNER.

APPLICATION FILED AUG. 4, 1920.

1,395,187. Patented Oct. 25, 1921.

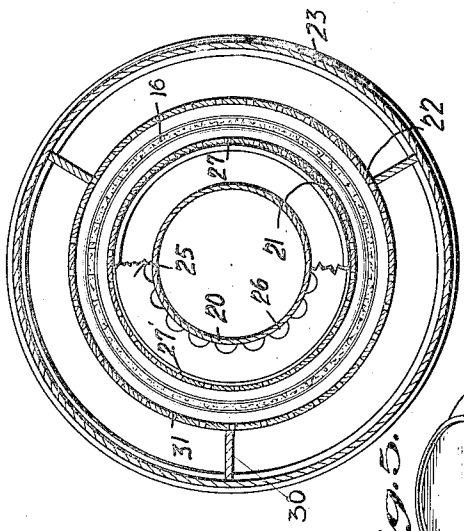


Fig. 3.

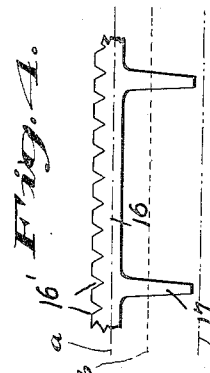


Fig. 4.

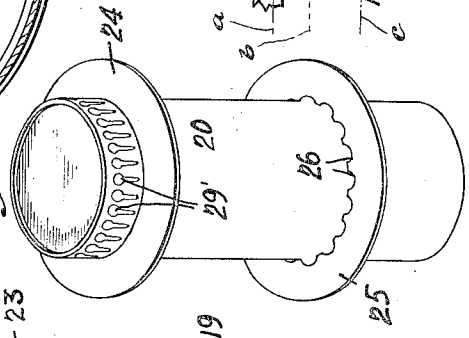


Fig. 5.

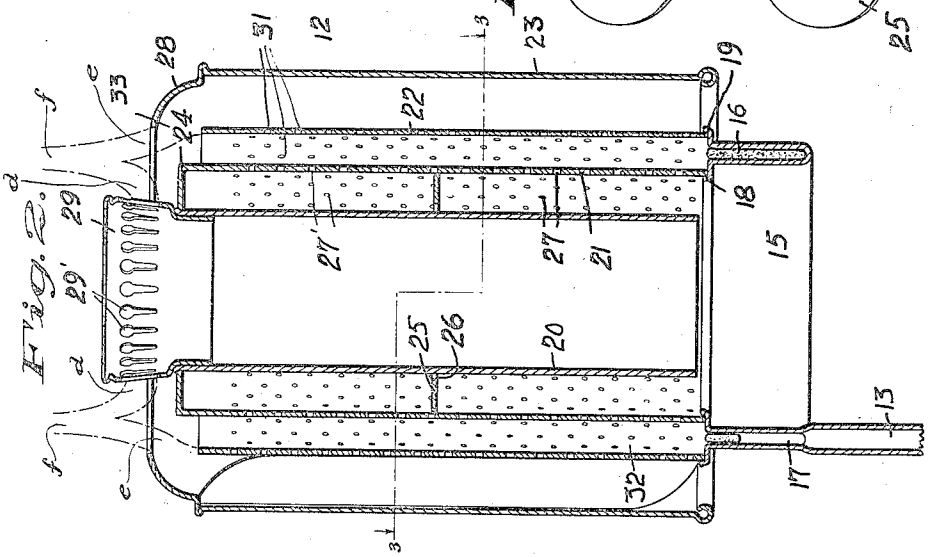


Fig. 2.

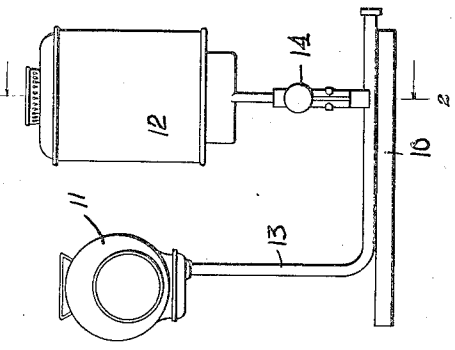


Fig. 1.

WITNESSES

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HYDROCARBON-BURNER.

1,395,187. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed August 4, 1920. Serial No. 401,089.

To all whom it may concern:

Be it known that I, ALFRED KAUFMAN, a citizen of Germany, but having declared my intention of becoming a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Hydrocarbon-Burner, of which the following is a full, clear, and exact description.

This invention relates to hydrocarbon burners of the same general nature as shown and described in my co-pending application Serial No. 385,235, filed on the 29th day of May, 1920, this invention, however, differing from the previous one in respect to the burner construction.

Among the objects of this invention is to provide a burner possessing efficiency with respect to the amount of fuel consumed and the degree of heat that it is capable of developing; to provide a burner that is clean, sanitary, and inoffensive and one which has satisfactory lasting qualities; to improve the construction of the gas generator or starter, and to generally improve this type of devices with respect to simplicity, economy and durability.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which

Figure 1 is a diagram indicating in side elevation a complete device including the oil supply tank.

Fig. 2 is a vertical sectional view of my improved burner including a removable cap or spreader.

Fig. 3 is a horizontal sectional view of the same on the broken line 3—3 of Fig. 2.

Fig. 4 is a development of a portion of the fibrous starting member showing especially its form in elevation.

Fig. 5 is a detail view of a modification in which the spreader is a fixed part of the draft chamber.

Referring now more particularly to the drawings I show my device as comprising a base 10, a reservoir 11, a burner 12 and conveying and controlling means for the liquid fuel or oil between the tank and the burner including a tube 13, and manually actuated valve means 14.

The burner as a whole comprises a generator or a base portion 15 in the form of an annular open topped reservoir to which the conveyer tube 13 delivers the oil, the quantity of oil delivered thereby being determined by the elevation of the burner with respect to the tank 11 and the manipulation of the valve 14. Within this annular trough is a fibrous starter member 16 whose upper edge is notched or serrated at 16′ for an efficient distribution of the liquid fuel supply, and whose lower portion consists simply of a relatively small number of legs 17. This construction is economical in the material of the starter, and inasmuch as there is no combustion or consumption of this member in the use of the burner the serrated upper edge portion thereof may be relatively narrow and still be possessed of full virtue. The level of the fuel during the operation of the burner at full force may be anywhere along the main body portion of the starter, as for example as indicated by the line *a*. The legs 17, however, provide that if but a relatively slight degree of heat is desired to be maintained the adjustment of the burner may be such as to bring the level of the oil at the line *b* and hence the measure of heat will be determined by the amount of oil that will be carried by capillarity upward along the legs. When the fire is to be extinguished the burner will be further lifted so as to bring the level of the oil at the line *c* or lower.

The vertical walls of which the reservoir 15 is constituted project inward and outward respectively at 18 and 19 and thence upward forming offset flanges or supports for the parts of the burner supported thereon in practice. The flange portion 18 has a free open center through which fresh air is adapted to pass freely and without obstruction from beneath the burner.

The main portion of the burner comprises a series of vertical coaxial tubular members 20, 21, 22 and 23 all spaced from one another. The innermost members 20 and 21

are united for mutual support by means of a collar 24 connecting their upper ends and also by a collar 25 extending between the middle portions of the members. The innermost tubular member constitutes a draft chamber for fresh air, and it and the collar 24 are imperforate, the draft chamber, however, being freely open at its upper and lower ends. The collar 25, however, is provided with air passages 26 formed preferably adjacent to the outer wall of the member 20, the collar thus restricting the flow of air.

The tubular member or drum 21 is provided with numerous perforations 27 and the lower end thereof between the flange 18 and the draft chamber 20 is freely open for the up-draft or passage of fresh air upward toward the collar 25. The principal part of this air passes outward through the holes 27 while the smaller portion of the air which passes upward through the holes 26 may pass outward through holes 27′ in the upper portion of the drum 21.

The outermost drum 23 is imperforate. The upper end thereof is open and spaced liberally from all of the other parts, though provided with a crown 28 curved upwardly and inwardly toward the cap 29 fitted removably in or connected otherwise to the upper end of the draft tube 20. The lower end of the drum 23 also is open and spaced from the outwardly projecting flange 19 of the support giving free admission of fresh air into the space between the drums 22 and 23 and which space is maintained by spacing members 30 fixed to the drum 22 and upon the upper ends of which the crown portion 28 of the outermost drum is adapted to rest. The drum 22 is of straight tubular form open at both ends and provided with numerous perforations 31 extending through the sides thereof. The space between the drums 21 and 22 constitutes a generating and primary mixing space 32. This space is in direct vertical alinement with the open top of the generator chamber 15. On lifting or tilting the drum structure from the support 18 and 19 the oil will be ignited at the starter and then with the lifted or tilted structure returned to its normal position the gas generated at this place passes upward and around within the space 32 and while so passing along this space becomes thoroughly mixed and suitably diluted by fresh air passing outward through the holes 27 and inward through the holes 31, and it finally passes upward beyond the upper end of the drum 22 and out through the throat 33. The crown 28 tends to deflect the current of burning mixture inward toward the axis of the drums and this inward tendency is counteracted by the upward draft of air through the chamber 20 and is augmented by the cap 29 when used. This cap is shown provided with a closed or imperforate top and with an annular series of keyhole slots 29′ formed around its side wall.

In all other hydrocarbon burners with which I am familiar it is difficult to produce a proper flame or a flame resulting from a proper mixture of fuel gas and air, especially when the burner is set or adjusted to produce different degrees of heat. In this burner, however, I am able to produce a suitable mixture of gas and air and thus develop a high degree of efficiency in heat production irrespective of the degree or volume of heat being produced.

In the practice of the burner the gas generated at and above the starter 16 flows upward in what may be termed a hollow column and emerges from the upper end of the drum 22. Nearly all of the column of gas is thus delivered in unburned condition, the column carrying only flame enough to ignite the gases after being further mixed inside and outside of the hollow column at the points *d* and *e* respectively. In other words when the gas at the top of the column is engaged by the films of air delivered from the draft member 20 and from the space between members 30 respectively and the proper combustible mixture is thus produced there are formed two distinct rings of fire at these points *d* and *e*. The presentation of the air in this manner to the moving column of gas in two relatively thin films insures a better and freer mixture of the gas and air than could possibly result from the presentation of the air on only one side of the column of gas. Soon after the formation of these two rings of fire they combine at or about the hottest point of the flame somewhere about as indicated at *f*. Since the cap 29 may be formed as a removable part of the structure it is practical for the burner to be used without the cap in which case the air through the draft member 20 passes without obstruction or restriction to combine with the gas on the inside of the column, broadly the same as above described though with somewhat less efficiency than with the cap because of the somewhat more unfavorable mixing of the air. The collar 25 serves primarily as a baffle for restricting the flow of air between the drums 20 and 21 and thus the inner portion of the column of gas passing upward through the mixing space 32 is retained in a relatively cool and unburned condition until it reaches the top of the mixing space. Sufficient air, however, is provided through the openings 26 and holes 27′ to insure ignition of the inner surface of the column of gas above the drum 21, and whereby the ring of flame at *d* is insured.

I claim:

1. The herein described starter for hydrocarbon burners comprising a continuous fibrous body and spaced fibrous supporting

legs connected with said body and having small capillarity relatively to said body.

2. The herein described starter for hydrocarbon burners comprising a continuous fibrous body provided with indentations along its upper surfaces and spaced fibrous supporting legs connected with said body and depending therefrom.

3. In a hydrocarbon burner a starter comprising a fibrous member formed with a plurality of depending legs and a surrounding oil receiving container whereby the amount of oil utilized will be determined by the depth at which the fibrous member operates in the oil.

ALFRED KAUFMAN.