Feb. 16, 1926. 1,573,654

A. STOCKSTROM

HYDROCARBON BURNER

Filed June 12, 1925

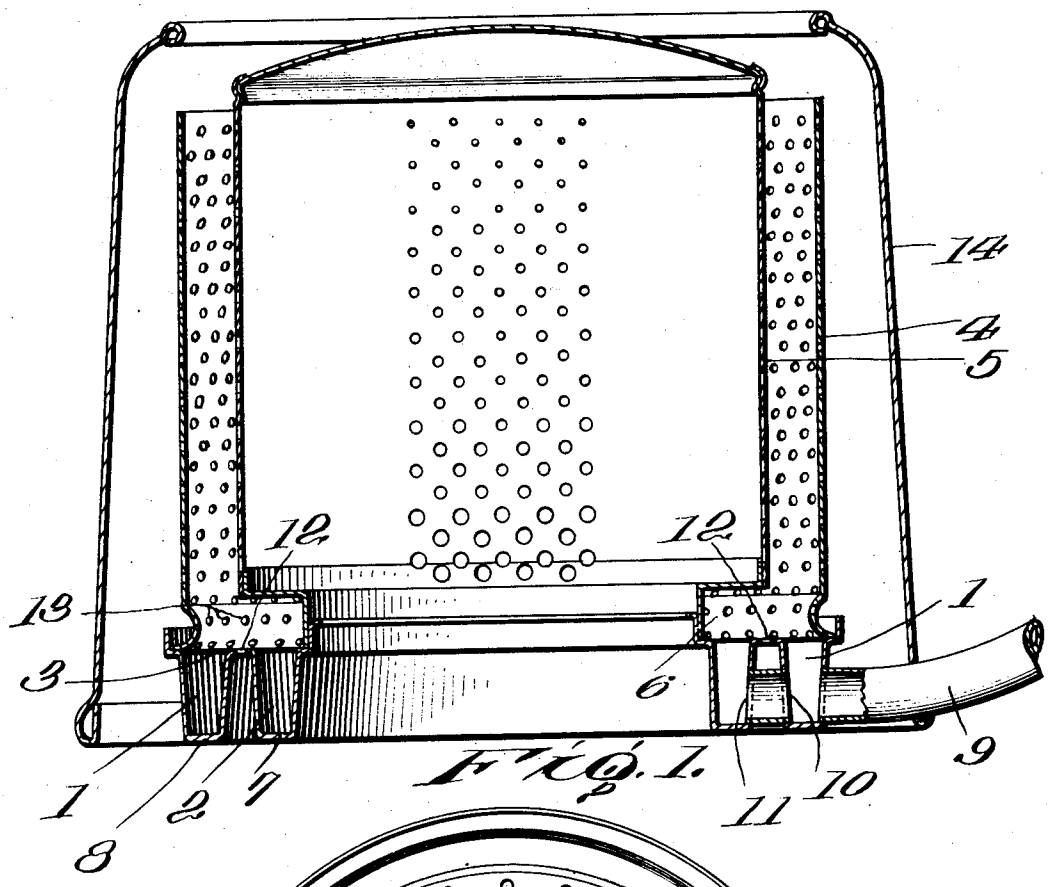


Fig. 1.

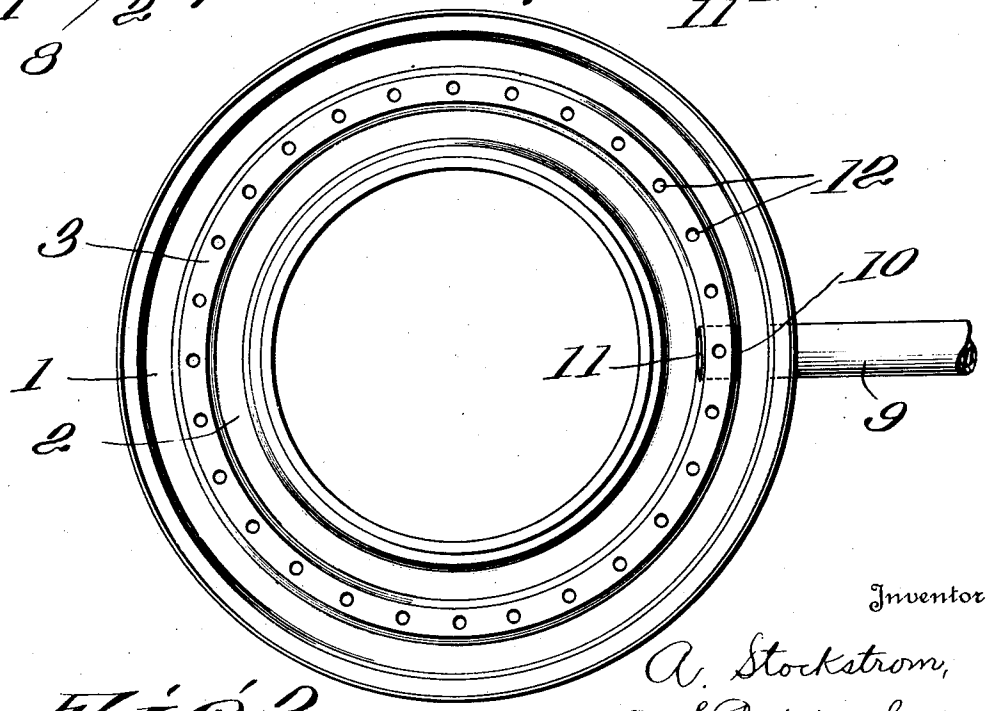


Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR STOCKSTROM, OF ST. LOUIS, MISSOURI, ASSIGNOR TO AMERICAN STOVE COMPANY OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

HYDROCARBON BURNER.

Application filed June 12, 1925. Serial No. 36,595.

To all whom it may concern:

Be it known that I, ARTHUR STOCKSTROM, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Hydrocarbon Burners, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in hydrocarbon burners and it is of that type in which gasoline is fed in relatively small quantities, and is generally referred to in the art as a gasoline drip burner.

The means for feeding the gasoline is well understood by those skilled in the art and therefore it is not illustrated herein.

The object of the present invention is to increase the generating capacity of the burner whereby a larger amount of fuel can be vaporized and burned at the upper end of the combustion section.

A further object of the present invention is to provide two concentric separated troughs having wide bottoms which in operation equalizes the distribution of fuel and the vapor formed therefrom. The double bowl it is found gives equal distribution of vapor and flame throughout the entire circumference of the burners under all conditions of fuel feed regulation. That is, it is found in practice that the fuel supply may be cut down so that only a small flame is produced, and the flame will be evenly distributed around the burner.

Another object of the present invention is to provide a burner comprising concentric troughs, and a combustion section which has its lower end expanded laterally to embrace the upper ends of both of the troughs, the expanded end being sufficiently located above the upper ends of the troughs so that there is room for the proper distribution of the vapor generated within the troughs.

Another object of the present invention is to provide concentric troughs which are connected at their upper ends by a perforated horizontal web, which in operation initially burn small flames for heating the burner, but when the troughs have become heated then the flame rises above these openings and burns between the combustion sections above.

A further object of the present invention is to provide a combustion section with an enlargement at its lower end that embraces both of the concentric troughs, the outer wall opposite the enlarged portion of the combustion section having perforations in its side for feeding air into the combustion space thereby maintaining the initial flame for heating the troughs at the web portion between them, and providing proper air for mixing with the vapor after the troughs have become heated.

Further detailed objects of the invention will appear from the following description and disclosure.

After considerable experimentation and tests, I have finally succeeded in providing a hydrocarbon burner, especially utilizing gasoline, that increases vaporization of the gasoline, and also increases the vapor generated from the gasoline, and enables me to accomplish an even distribution of vapor and flame even though the flame be cut down, both of which, so far as I am aware has not been heretofore accomplished.

Referring now to the drawings:

Figure 1 is a vertical central sectional view of my improved burner.

Figure 2 is a top plan view of the troughs with the combustion section removed.

1 is an outer trough having its top portion open and 2 an inner concentric trough of the same construction as the trough 1. These troughs 1 and 2 are connected at their upper ends by a transverse web portion 3 which extends throughout the circumference of the troughs and serves to unite them.

Positioned above the upper ends of the troughs is a combustion section which consists of two concentric perforated tubes 4 and 5, the said tubes being located very much closer together than the combined width of the concentric troughs 1 and 2. Therefore the lower end of the combustion section is constricted inwardly thereby enlarging the lower end of the combustion section as shown at 6 whereby it embraces the upper ends of both of the said troughs.

Attention is directed to the fact that these troughs have their bottoms 7 and 8 substantially flat, or the bottoms are made wide whereby there is increased space for the fuel and thereby increased vaporization of the fuel which increases the amount of vapor produced from these troughs. A pipe 9 has its lower end passing through the lower ends of both of the troughs as shown, the inner and outer walls of the outer trough

1 being perforated as shown at 10 substantially equal to the opening in the pipe 9, and the outer wall of the inner trough 2 being perforated as at 11, whereby the fuel flows from the pipe into the bottoms of both of the troughs.

I have found in my work with this burner that when the burner is cold as in starting it is necessary to provide initial flames for heating the troughs, and these initial flames are provided at the perforations 12 through which perforations air passes, thus causing the flame at that point for initially heating the troughs. There are a series of these perforations as clearly indicated in Figure 2 which shows that these openings are arranged short distances apart around the web portion 3. When the burner is heated up, the flame naturally rises and these initial flames are extinguished, the flame rising above and burning between the two tubes 4 and 5.

When the burner troughs are cold and the initial flames burning, air passes through the openings 13 of the enlarged portion 6, this air maintains these flames, as I find it essential that air be admitted in the enlarged portion for supplying initial flames with the necessary oxygen for burning.

The usual hood 14 surrounding the combustion section and the troughs is provided, but it forms no part of my present invention, it being substantially old in the prior art.

I have not here shown any means for feeding the gasoline to the troughs, as this is well known to those skilled in the art. Ordinarily the usual needle valve (not shown) is utilized for this purpose.

From the above description it will be observed that gasoline is fed to the relatively wide bottoms of both of these troughs. It is then lighted, and it is essential that air be provided for maintaining the initial flames and the main flame from the vapor in the troughs. Consequently the openings 13 in the enlarged portion provides the necessary air for maintaining the initial flames which are very important in quickly heating up the troughs so that there will be a generation of the vapor. The flame as the troughs heat up gradually rises between the combustion sections, when the initial flames will be extinguished by the upflowing vapor, the flame being transferred to a point above in the combustion section. When the combustion section has become heated, the inner perforated wall 5 usually becoming red hot, heat is conveyed by conduction of the hot combustion sections to the troughs and keeps the troughs hot so that the vaporization of the gasoline continues.

I have found in the operation of a device constructed substantially as hereinbefore described that the maximum flame is much increased over that produced by the ordinary one trough construction and with a single combustion section. I also find that when the flow of fuel is cut down to a minimum there is a uniform distribution of vapor throughout the combustion section and a uniform flame at the top of the combustion section. It is new so far as I am aware to provide a burner having an increased capacity of flame which will have a uniform flame when the flow of gasoline is cut down to a minimum.

Although the burner herein described is especially adapted to use gasoline, yet it will be understood by those skilled in the art, that it is also adapted to vaporize and distribute heavier oils such for instance as kerosene. When using kerosene of course it is necessary that the burner be first heated up by the use of gasoline or if kerosene is used that some means be provided for igniting it in its initial starting.

Changes may be made in the burner without departing from the spirit and scope of the invention so long as they come within a fair interpretation of the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A hydrocarbon burner comprising concentrically arranged separated trough, a single combustion section located above the troughs, the lower end of the combustion section embracing the upper ends of the troughs, for the purpose described.

2. A hydrocarbon burner comprising concentrically arranged troughs with open upper ends said troughs having separated inner vertical walls, a single combustion section located above the upper ends of the troughs, said combustion section having a lateral enlargement for embracing the upper ends of the troughs, for the purpose described.

3. A hydrocarbon burner comprising concentrically arranged troughs, said troughs having flat bottoms for the purpose of increasing vaporization, the troughs having separated vertical inner walls connected at their upper ends by a horizontal web, a combustion section located above the troughs, the lower end of the combustion section laterally enlarged to embrace both of the troughs, for the purpose described.

4. A hydrocarbon burner comprising concentrically arranged troughs, the adjacent walls connected by a horizontal perforated web having perforations, a combustion section above the said troughs, the lower end of the combustion section laterally enlarged to embrace the upper ends of both troughs, whereby a plurality of initial flames are maintained at the perforations in the web portion, for the purpose of heating up the troughs.

5. A hydrocarbon burner comprising concentric troughs connected at their upper adjacent walls by a transverse perforated web, a combustion section above the said troughs, the lower end of the combustion section enlarged laterally to embrace both of the said troughs, the side wall of the outer combustion section provided with openings opposite the enlargement, the parts arranged for the purpose described.

6. A hydrocarbon burner comprising concentrically arranged troughs with open upper ends, the upper ends connected by a web and having initial fire openings, a combustion section above the said troughs, the lower end of the combustion section enlarged laterally a substantial distance above the said troughs whereby the said combustion section embraces the upper ends of both of the said troughs.

7. A hydrocarbon burner comprising concentric troughs having their inner and outer walls of substantially the same height, and a combustion section made up of two perforated tubes, the lower end of one of the tubes enlarged laterally to embrace both of said troughs.

8. A hydrocarbon burner comprising troughs with open upper ends having their inner and outer walls of substantially the same length, their inner walls connected by a perforated web, and a combustion section composed of two vertical perforated tubes, one of said tubes enlarged laterally whereby both troughs are embraced within the lower end of the combustion section for the purpose described.

9. A hydrocarbon burner comprising two isolated concentric troughs connected at their upper ends by a transverse web, and a combustion section composed of two vertical concentric tubes, the inner concentric tube extending inward above the upper ends of the troughs whereby the troughs are embraced within the combustion section and a space remains between the lower end of said inner tube and the tops of the troughs.

10. A hydrocarbon burner comprising concentric troughs having their inner and outer walls substantially the same height, of a combustion section composed of two vertical perforated tubes, one of said tubes bent laterally an appreciable distance above the troughs, whereby the lower ends of the tubes embrace both troughs and a space is formed between the bent portion of the tube and the troughs.

In testimony whereof I hereunto affix my signature.

ARTHUR STOCKSTROM.