E. P. HARMS.

HYDROCARBON BURNER.

APPLICATION FILED DEC. 27, 1907.

907,043. Patented Dec. 15, 1908.

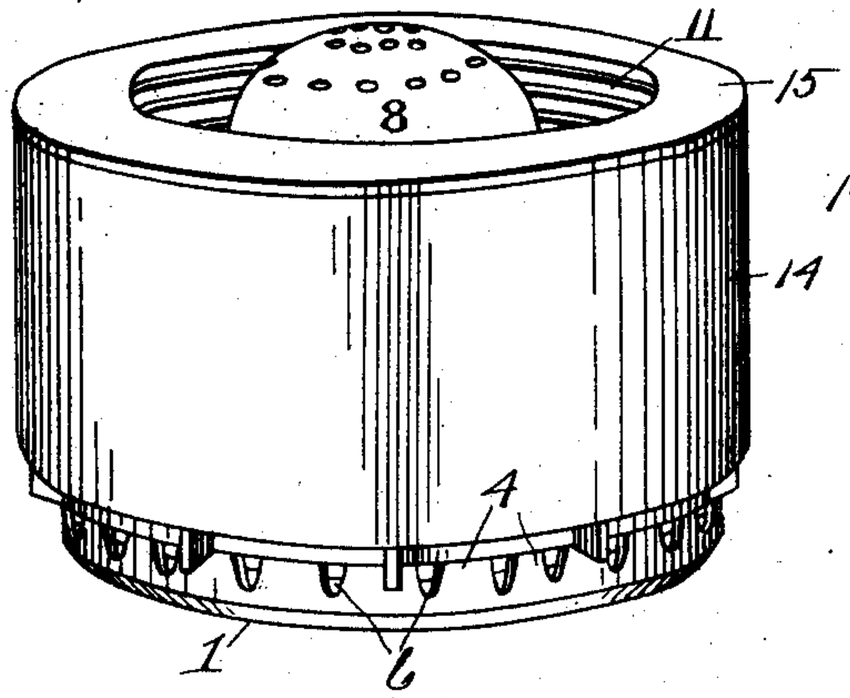

Fig. 1.

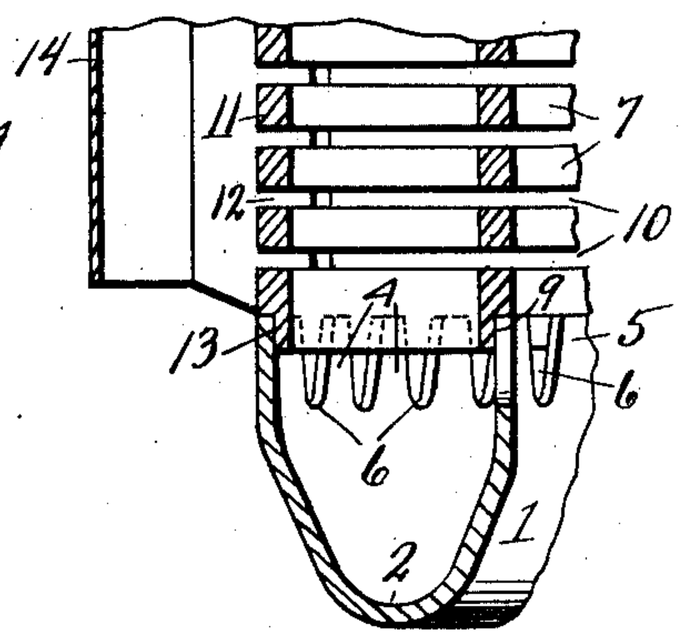

Fig. 4.

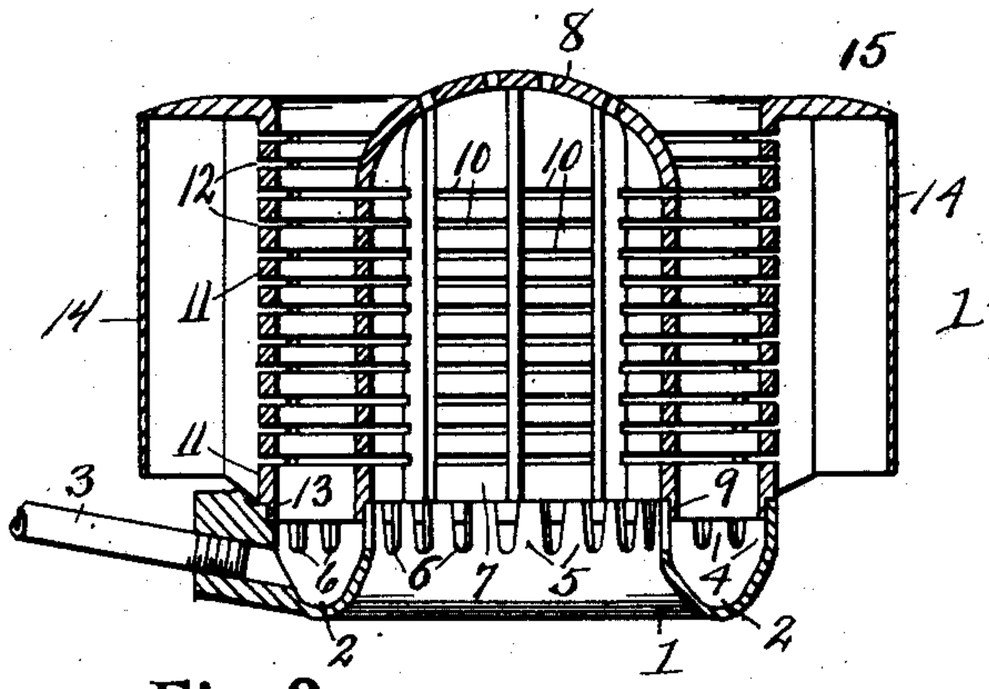

Fig. 2.

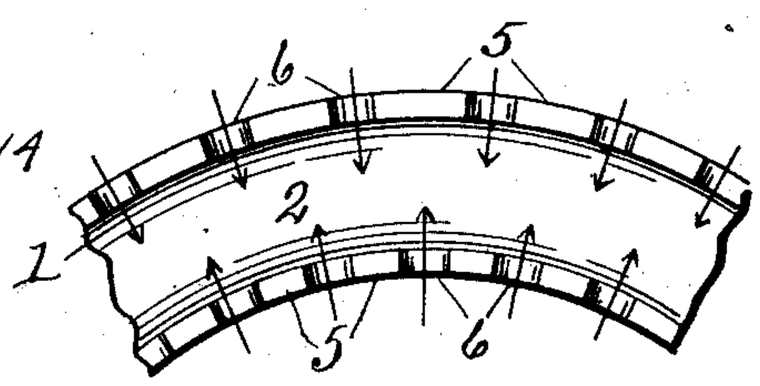

Fig. 5.

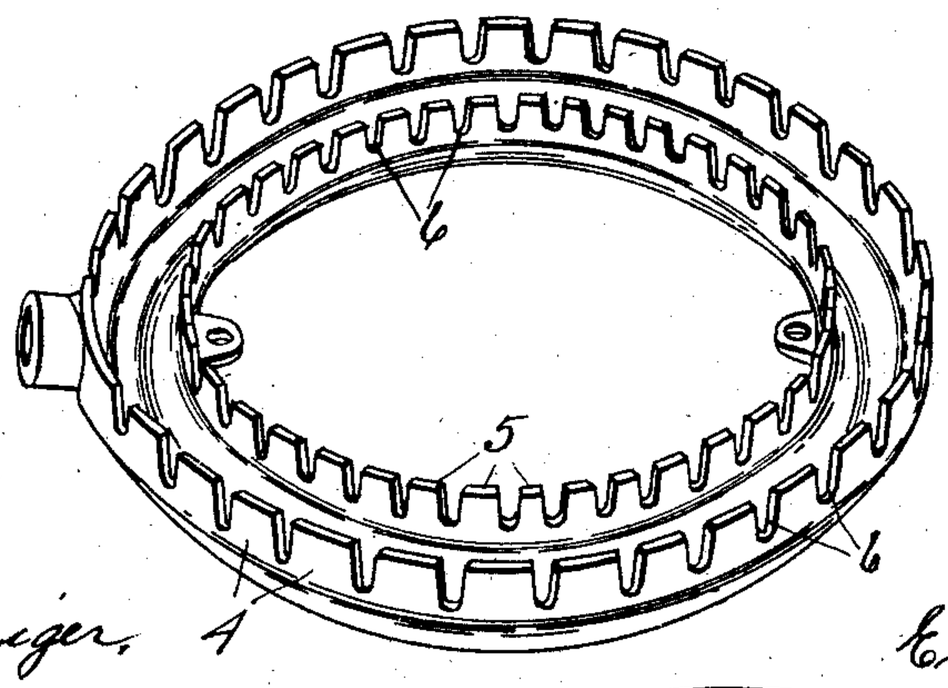

Fig. 3.

Witnesses

O. B. Baenziger.

F. G. Howlett.

Inventor

Edwin P. Harms.

By E. W. Wheeler & Co.

Attorneys

UNITED STATES PATENT OFFICE.

EDWIN P. HARMS, OF DETROIT, MICHIGAN.

HYDROCARBON-BURNER.

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To all whom it may concern:

Be it known that I, EDWIN P. HARMS, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to hydrocarbon burners, or to burners of the type capable of burning fluid fuel, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The primary object of the invention is to produce a burner of the character described, wherein the base is so formed as to enable it to be quickly heated after the burner is lighted, whereby a proper vaporization of the fuel may be attained within a minimum of time.

A further object is to provide means for supplying oxygen to the vaporized fuel at a point close to the surface thereof, effecting a more perfect combustion of the fuel within the trough of the base by furnishing an adequate supply of oxygen thereto at that point.

A further object is to construct a burner base of the character described, having such formation as to combine efficiency with cheapness of manufacture.

The above objects are attained by the structure illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of a burner embodying my invention. Fig. 2 is a central vertical section therethrough. Fig. 3 is a perspective view of the base. Fig. 4 is an exaggerated fragmentary view in section through the base and the slotted walls resting thereon which form between them the flame space above the fuel trough of the burner. Fig. 5 is an enlarged view in plan of a fragment of the base.

Referring to the characters of reference 1 designates the base of the burner which is preferably cast of iron in circular form and which is substantially V-shape in cross section, producing a trough 2 into which the fuel flows from the supply pipe 3 and around which the more dense vapor from said fuel will travel to effect an equal distribution thereof throughout the area of the fuel-containing base.

Rising from the outer edge of the trough of the base are the tapered prongs 4 and extending in like manner from the inner edge of said trough are the tapered prongs 5. These prongs, as will be seen, are spaced to form openings 6 between them and are integral with the edges or margins of the base. These prongs are termed heat conducting prongs or fingers and are adapted by conductivity to convey the heat which surrounds them to the wall of the trough of the base, thereby quickly heating said trough to a high temperature and effecting a rapid vaporization of the fuel therein.

I prefer to arrange the heat-conducting prongs in the manner shown in Fig. 5, wherein said prongs are so disposed upon the opposite margins of the base that the prongs on one side shall be diametrically opposite the apertures 6 between the prongs on the opposite side, the purpose of which is to distribute more thoroughly over the surface of the fuel in the trough the oxygen which is supplied in the air currents that are drawn through said apertures as indicated by the arrows in Fig. 5 when the burner is in operation. By so distributing the supply of oxygen over the entire surface of the fuel in the trough of the burner, accumulation of dense vapor at any point is obviated, and provision made for a more perfect combustion of the vaporized fuel by furnishing a uniform supply of oxygen thereto at a point close to the bottom of the fuel trough.

The flame space or combustion chamber as is common in burners of this type, is formed between foraminous or slotted walls which rise above the base from the opposite sides of the fuel-containing trough upon the edges of which said walls are usually supported. As illustrated herein, the inner wall of the combustion chamber is formed of a cylindrical body 7 open at its lower end and closed at its upper end by a rounded apertured cap 8. The wall of this cylindrical body 7 is slitted circumferentially, as is common in the art, to form openings through said wall communicating with the combustion cham-

ber through which air is admitted thereto. The lower edge of the cylindrical body or member forming the inner wall of the combustion chamber is rabbeted, as shown at 9, and said body is of such diameter as to fit upon the inner circular row of prongs 5 projecting from the base which prongs lie in said rabbet and prevent lateral movement of said cylindrical wall, the interior of which communicates with the central opening in the base through which air is admitted within said cylindrical body. The air from within said cylindrical body is drawn through the slots 10 in the wall thereof to support combustion within the flame space or combustion chamber in the burner, as will be well understood in the art.

The outer wall 11 of the flame space or combustion chamber is also cylindrical in form and is concentric with the inner wall, and like said inner wall is slotted circumferentially as shown at 12 to afford air openings for the admission of air into the flame space or combustion chamber. The bottom of said outer wall is rabbeted, as shown at 13, and said rabbeted portion receives the prongs 4 extending from the outer margin of the trough of the base and upon which said outer wall is supported. By means of this arrangement a flame space or combustion chamber is formed between the cylindrical walls through the circumferential slots in which air is admitted to support combustion within said flame space, as is common in the art.

It will be noted that when the cylindrical concentric walls of the burner are in position upon the base, their lower edges which rest upon the rows of prongs 4 and 5 respectively projecting from the margins of the base or fuel-containing trough will close the upper portion of the openings 6 between the prongs of the base and convert said openings into orifices which extend between said prongs below the lower edges of the walls of the burner, and which serve as air induct ports communicating with the trough of the burner on opposite sides thereof, as clearly shown in Figs. 2 and 4, the lower edges of the cylindrical burner walls forming a complementary portion of the wall of said orifices.

Surrounding the outer wall of the burner is a sheet metal hood 14 which depends from the laterally projecting cap portion 15 of said wall, a structure common in the art.

In the operation of this burner, fluid fuel is permitted to flow into the trough of the burner base through the pipe 3. If the fuel used is gasolene, it will vaporize sufficiently upon entering the trough of the burner to enable it to be at once ignited. The draft created by the upward passage of the caloric current between the walls of the burner will draw air into the burner trough through the orifices between the prongs projecting from the margins thereof. The entrance of the air through said orifices will supply sufficient oxygen to the vapor on the surface of the fuel to make a combustible mixture and greatly accelerate combustion. The inwardly flowing currents of air through the orifices between the heat conducting prongs on the margins of the trough of the base tend to more perfectly support combustion at those points, causing the inwardly extending tongues or jets of flame which surround said orifices, to project partially across the trough of the burner. These jets of flame hang closely to the margins of said orifices and quickly heat to a high temperature the prongs 4 and 5 which temperature is conveyed by conduction to the base or burner trough, the temperature of which is quickly raised thereby to a point to cause a rapid vaporization of the fuel therein so that within a comparatively few seconds of time after the starting of the burner, the base or burner trough will have become sufficiently heated to readily vaporize the fuel as it flows therein, enabling the highest efficiency of the burner to be almost immediately attained.

By casting the base of the burner with the heat conducting prongs projecting from the margins thereof, and by seating the lower edges of the burner walls upon said prongs to form orifices between them in the manner described, provision is made, as set forth, for perfectly supplying the required amount of oxygen to the vapor in said trough, and for quickly heating the trough or base of the burner to the required temperature for properly vaporizing the fuel, while a burner base of this character is very simple in construction and may be cheaply manufactured.

What I claim is:

1. As an article of manufacture, a burner base for fluid burners, comprising a trough for the reception of said fuel, said trough having heat conducting prongs formed upon the opposite margins thereof and integral therewith, said prongs upon each margin of said base being spaced from one another to form air openings therebetween.

2. As an article of manufacture, a base for a fluid fuel burner, comprising a circular trough for the reception of said fuel, having parallel margins, heat conducting prongs projecting vertically from the margins of said base and describing concentric rings, said prongs upon each margin being spaced to afford air openings between them on opposite sides of said trough.

3. In a fluid fuel burner, the combination of a base having a trough therein for the reception of said fuel, and provided with heat conducting prongs projecting vertically from a margin of said base, opposed vertical walls located above the base to form a flame space,

one of said walls resting at its lower edge upon said prongs and co-acting therewith to form air induct orifices.

4. In a fluid fuel burner, the combination of a burner base having a fuel trough provided with vertical margins, heat conducting prongs extending from said margins and spaced to form air openings between them, and opposed burner walls forming a flame space, said walls being mounted upon and supported by the heat conducting prongs of the base.

5. In a fluid fuel burner, the combination of a base having a fuel trough provided with heat conducting prongs along the margins thereof, said prongs being spaced to form air openings between them, parallel vertical walls resting upon said prongs and crossing the upper portion of said openings to form air induct orifices between said prongs and below the lower edges of said burner walls, of which said walls form a complementary part.

In testimony whereof, I sign this specification in the presence of two witnesses.

EDWIN P. HARMS.

Witnesses:
O. B. BAENZIGER,
I. G. HOWLETT.