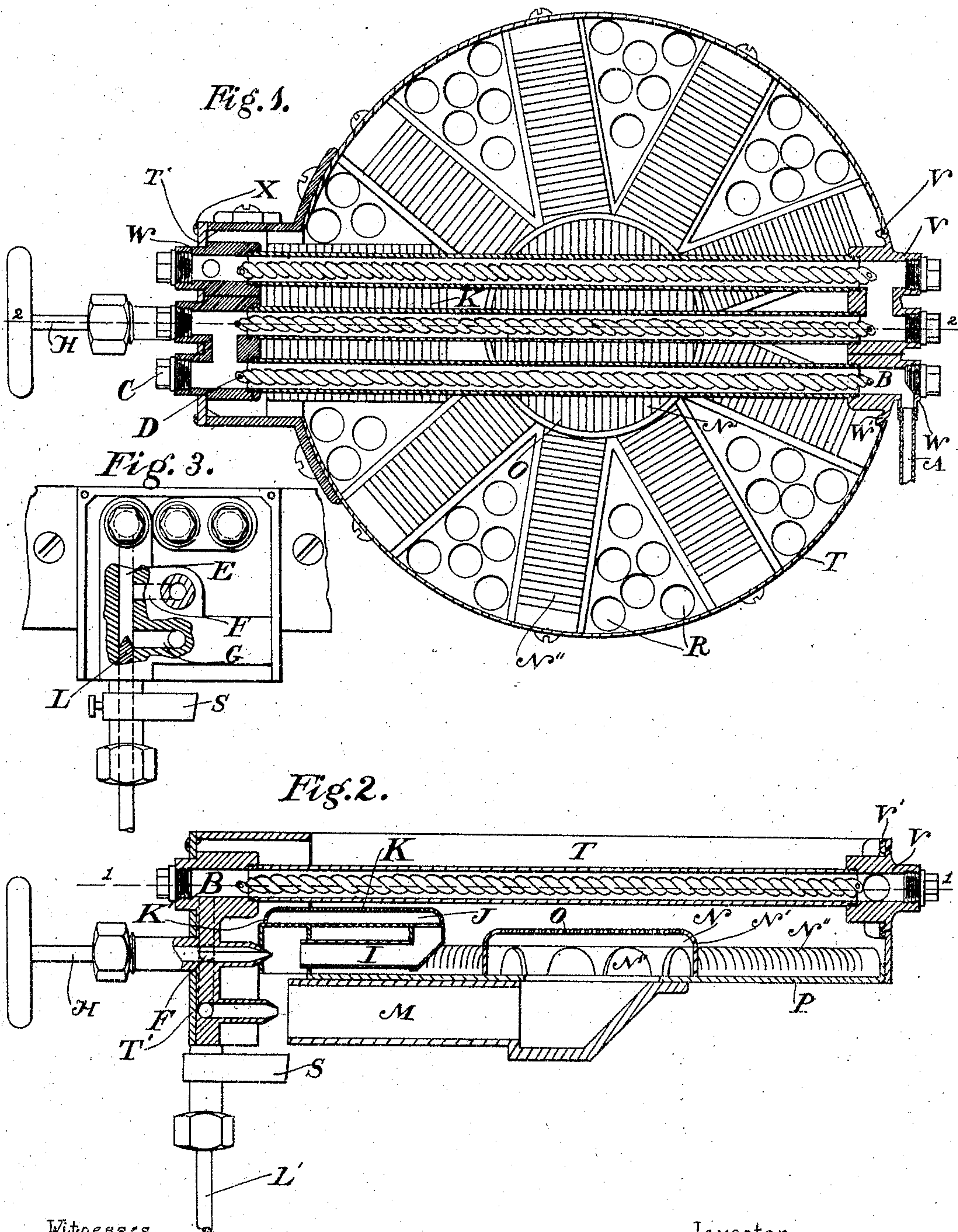


No. 778,443.

PATENTED DEC. 27, 1904.

C. F. CAPELL.  
HYDROCARBON BURNER.  
APPLICATION FILED DEC. 14, 1903.



Witnesses  
Jimmie H. Barklee.  
Mary Ann C. Nicholson.

by

Inventor  
Carl F. Capell  
Hazard & Harpham  
Attorneys.



# UNITED STATES PATENT OFFICE.

CARL F. CAPELL, OF LOS ANGELES, CALIFORNIA.

## HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 778,443, dated December 27, 1904.

Application filed December 14, 1903. Serial No. 185,142.

*To all whom it may concern:*

Be it known that I, CARL F. CAPELL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hydrocarbon - Burners, of which the following is a specification.

My invention relates to a burner designed to vaporize liquid hydrocarbon fuel and combine the vapor with air in sufficient quantity to burn; and the object thereof is to produce a burner in which the vapor of the liquid hydrocarbon fuel is discharged into two separate mixing - chambers, one of which has a much greater capacity than the other and in which the capacity of the burner may be controlled, while in the smaller chamber the fire is constant as long as the burner is in use. I accomplish this object by the mechanism described herein, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan of my burner, partly in section, the sectional part being taken on line 1 1 of Fig. 2. Fig. 2 is a vertical section on the line 2 2 of Fig. 1, a small portion being shown in elevation. Fig. 3 is an end view partly in section and partly broken away for clearness of illustration.

In the drawings, A is the supply-pipe, which is connected with a suitable reservoir (not shown) of liquid hydrocarbon fuel. This supply-pipe opens into the vaporizing-chamber B, which is composed of one or more chambers. If more than one chamber is used, the channel through the chamber is connected at opposite ends, as shown in Fig. 1, in which Fig. 1 I have shown three chambers, as I prefer that number; but a less or greater number may be used, if desired. In the ends of these chambers are plugs C, which may be removed for the purpose of cleaning, and in each chamber I place a piece of non-inflammable rope or cord D, upon which impurities carried by the liquid fuel collect and which may be removed from the chamber and cleaned when the plugs are out. To the end of the chamber farthest from the supply-pipe is connected conveyer-tube E, which is provided with branches F and G. The branch F is provided with a needle-valve H to control the

flow of vapor therethrough, which is discharged into the air-tube I, which tube opens into the mixing-chamber J, the top of which is provided with slots K, through which the commingled air and vapor passes and is burned at the top thereof just below one end of chamber B, said end being the end nearest to the outlet from said vaporizing-chamber. The lower end of the conveyer-tube is provided with a regulating-valve L, whose stem L' may be operated in any suitable manner to control the flow of vapor through branch G, which branch discharges the vapor into the air-tube M, which tube opens into the mixing-chamber, the top of which is provided with slots O. The central portion of this chamber N' is raised above the other portion, as shown in Fig. 2, and from this central portion radiate channels N'', the tops of which are curved and slotted. The channels and chambers are provided with a base-plate P, which between the channels N'' is provided with perforations R, through which air can pass to assist combustion.

In the operation of my burner a supply of liquid fuel is permitted to fill the starting-cup S, and it is then turned off and the fuel in the cup lighted. As soon as the burner is sufficiently hot the supply of fuel is again turned on and the needle-valve opened. The valve H is opened to its full extent, while the valve L is opened sufficiently to supply enough vapor to produce the necessary flame.

In order to protect the flame from draft, I provide a frame T, which extends around and above the channels N'' and other parts of the mixing-chambers, as shown. For convenience in construction I form the vaporizing-chamber of the pipes U, which are screwed into fittings V and W. The fittings V are what may be termed "double" fittings, and the fittings W are a single fitting, so that one of the pipes U may be screwed into the double fittings, and afterward the pipes on either side may be screwed into the double fittings and the single fittings screwed onto the pipes. The frame is provided with a removable plate T', which is removed when the vaporizing-chamber is placed in position in the burner and is then replaced and fastened by screws



X, which serve to hold the plate to the other parts of the frame. The rear end of the fittings pass through a hole in the frame. Inside of the frame the fittings are provided  
5 with flanges V' and W', which prevent the further movement of the chamber through the frame. The front part of the frame forms an inclosure around three sides and the top of the conveyer-tube, so as to prevent the cool  
10 air from coming in contact with the parts which discharge the vapor into the air-tubes.

Chamber J has a slot K', which discharges the fuel toward the conveyer-tube, and the same burns around the tube, thereby keep-  
15 ing it hot and preventing the fuel from returning back to its liquid state.

When the vaporizing-chamber requires cleaning, by removing plate T' it may be removed, cleaned, and replaced without inter-  
20 fering with any of the other parts, the supply-pipe being first disconnected.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

25 1. A hydrocarbon-burner comprising a plurality of tubes connected together having a liquid-fuel inlet at one end and a vapor-outlet at the other end; two mixing-chambers under said vaporizing-chamber having their tops  
30 slotted, one of said mixing-chambers being smaller than the other and being located adjacent to the vapor-outlet, and having one of the slots thereof adjacent to the vapor-tube to permit vapor to escape therefrom to burn  
35 around the vapor-tube whereby it is kept in a heated condition; cords of non-inflammable material in the tubes forming the vaporizing-chamber; removable plugs in the ends of said  
40 tubes; air-tubes connected to said mixing-chambers; a vapor-tube having a channel having two outlets connected to said vaporizing-chamber, one of said outlets being adapted to discharge vapor into one of said air-tubes and the other outlet to discharge vapor into the  
45 other air-tube; a casing around said vapor-tube; valves adapted to control the discharge of the vapor from said outlets.

2. A hydrocarbon-burner having a vaporizing-chamber composed of three vaporizing-  
50 tubes alternately connected together at opposite ends; a liquid-fuel inlet at one end of said tubes and a vapor-outlet at the other end of said tubes; non-inflammable cords in said tubes; removable plugs in the ends of said  
55 tubes; a vapor-tube having a channel having two outlets connected with said vaporizing-tubes; a small mixing-chamber under the ends of said tubes adjacent to said outlet-channel, a larger mixing-chamber under said tubes hav-  
60 ing a central space and radiating channels extending therefrom, said mixing-chambers having slotted tops; air-tubes connected with said mixing-chambers to receive the discharge of vapor from the vapor-channels.

65 3. A hydrocarbon-burner having a vaporiz-

ing-chamber composed of three vaporizing-  
tubes alternately connected together at oppo-  
site ends; a liquid-fuel inlet at one end of said  
tubes, and a vapor-outlet at the other end of  
said tubes, and being on opposite sides there- 70  
of; non-inflammable cords in said tubes; re-  
movable plugs in the ends of said tubes; a va-  
por-tube having a channel having two outlets  
connected with said vaporizing-tubes; a small  
mixing-chamber under one of the ends of said 75  
tubes; a larger mixing-chamber under said  
tubes having a central space and radiating  
channels extending therefrom, said radiating  
channels having curved slotted tops, said  
chambers also having slotted tops; air-tubes 80  
connected with said mixing-chambers to re-  
ceive the discharge of vapor from the vapor-  
channels.

4. A hydrocarbon-burner having a frame; a vaporizing-chamber composed of three vap- 85  
orizing-tubes alternately connected together  
at opposite ends in said frame and having the  
ends thereof projecting out through said  
frame; a liquid-fuel inlet at one end of said  
tubes and a vapor-outlet at the other end of 90  
said tubes; non-inflammable cords in said  
tubes; removable plugs in the ends of said  
tubes; a vapor-tube having a channel having  
two outlets connected with said vaporizing-  
chamber, said last vapor-tube being surround- 95  
ed on three sides and at the top by said frame;  
a removable plate in said frame surrounding  
the ends of the tubes comprising the vaporiz-  
ing-chamber; a small mixing-chamber under  
the end of said tubes adjacent to said vapor- 100  
outlet and provided with slots in the top there-  
of and one in the edge thereof adjacent to the  
vapor-tube; a larger mixing-chamber under  
said tubes having a central space with radiat- 105  
ing channels extending therefrom, said radi-  
ating channels and top being slotted; air-tubes  
connected to said mixing-chamber to receive  
the discharge of vapor from the vapor-outlets.

5. In a hydrocarbon-burner a vaporizing-  
chamber composed of a tube; removable plugs 110  
in the ends of the vaporizing-chamber; a liq-  
uid-fuel inlet at one end of said chamber and  
a vapor-outlet at the other end of said cham-  
ber; a vapor-tube having a channel therein  
terminating in an outlet connected to said va- 115  
por-chamber; a valve to control the flow of  
vapor from said outlet; a mixing-chamber hav-  
ing a slotted top under said vaporizing-cham-  
ber and having a slot adjacent to the vapor-  
tube to permit vapor to escape therefrom to 120  
burn around said tube whereby it is kept in a  
heated condition; an air-tube opening into said  
mixing-chamber adapted to receive the flow  
of vapor from said vapor-tube; a frame inclos- 125  
ing the vapor-outlet at the top and on three  
sides thereof, said frame also supporting and  
surrounding said vaporizing-chamber.

6. In a hydrocarbon-burner a vaporizing-  
chamber having a liquid-fuel inlet at one end  
and a vapor-outlet at the other end; two mix- 130



ing-chambers under said vaporizing-chamber  
having their tops slotted, one of said mixing-  
chambers being smaller than the other and  
being located adjacent to the vapor-outlet and  
5 having one of the slots thereof adjacent to the  
vapor-tube to permit vapor to escape there-  
from to burn around the vapor-tube whereby  
it is kept in a heated condition; a vapor-tube  
having a plurality of channels connecting with  
10 said vaporizing-chamber, said channels open-  
ing into air-tubes; a casing surrounding said  
tube and adapted to prevent a draft of air  
upon said tubes; valves in the channels from

said tube, said valves being adapted to control  
the flow of vapor therethrough; air-tubes 15  
opening into said mixing-chambers, said air-  
tubes being located to receive the discharge  
of vapor from said vapor-channels.

In witness that I claim the foregoing I have  
hereunto subscribed my name this 5th day of 20  
December, 1903.

CARL F. CAPELL.

Witnesses:

G. E. HARPHAM,

MARGARETE C. NICKELSON.