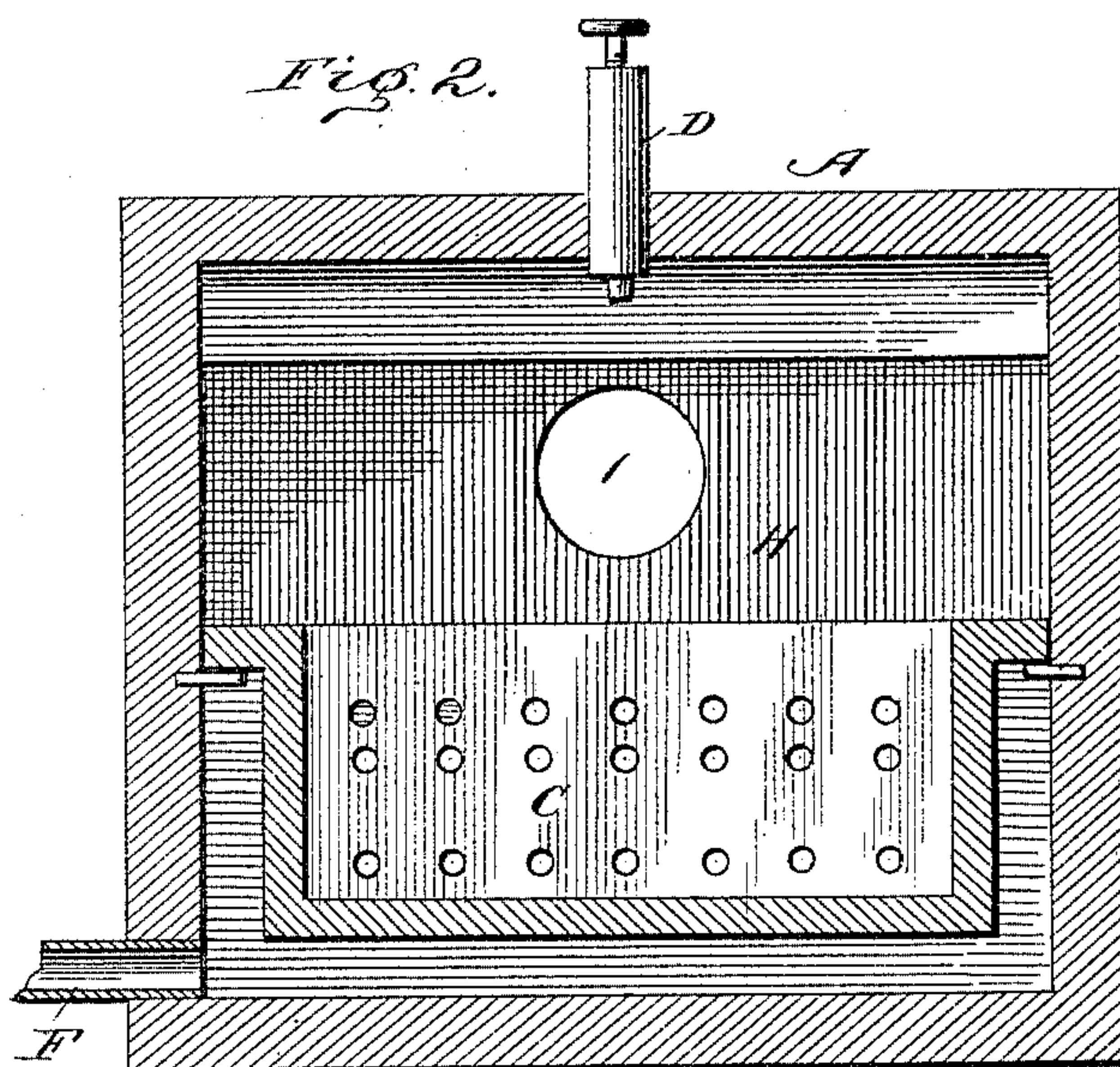
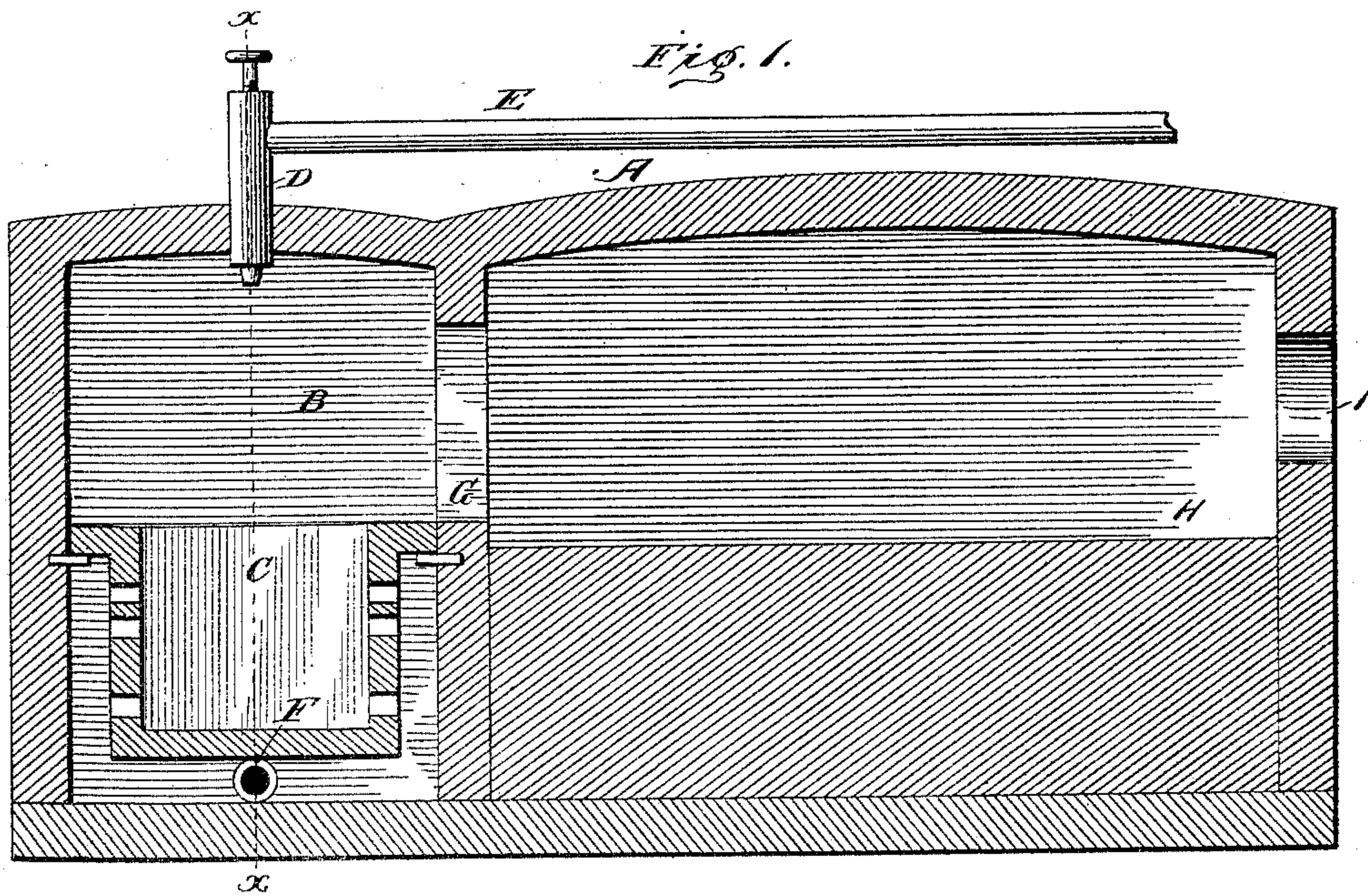


(No Model.)

S. H. BROWN.  
HYDROCARBON OR GAS FURNACE.

No. 497,750.

Patented May 16, 1893.



Witnesses

Edwin L. Bradford  
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# UNITED STATES PATENT OFFICE.

SAMUEL H. BROWN, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE BROWN DEVELOPING COMPANY, OF NEW JERSEY.

## HYDROCARBON OR GAS FURNACE.

SPECIFICATION forming part of Letters Patent No. 497,750, dated May 16, 1893.

Application filed November 14, 1892. Serial No. 451,865. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL H. BROWN, a citizen of the United States, residing at Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Hydrocarbon or Gas Furnaces; and I do hereby declare that the following is 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.

My invention relates to improvements in hydro-carbon furnaces, or furnaces in which gas or hydro-carbon vapor is employed as fuel.

The object of the same is to produce a furnace in which an intense heat may be obtained by the combustion of oil or gaseous fuel, for general heating, cremating or metallurgical purposes, when a fire free from ashes, soot and smoke is a desideratum.

The invention consists in an improved furnace having a fire chamber into which a liquid hydro-carbon or gas may be introduced, ignited and burned in conjunction with superheated air, the resultant burning gases being carried to a supplementary combustion chamber where a more complete combustion of the generated gases with the air is effected.

In the drawings, Figure 1, is a longitudinal, vertical section of my furnace, showing a reverberatory chamber at the rear of the same, and Fig. 2, is a transverse, vertical sectional view of the same, on the line  $x-x$  of Fig. 1.

A is a furnace constructed, preferably, of fire-brick, and B, the fire or combustion chamber of the same. Within this fire chamber is located a fire pot or open vertical retort C, which is of a shape to correspond with the interior of the furnace, and of such size as to leave a space or air passage between its outer sides and the inner sides of the walls of the combustion chamber. Said fire-pot or retort is also elevated above the bottom of the combustion chamber so as to form a chamber or passage below its bottom. The bottom of the retort is solid, but the walls of the same are perforated at suitable intervals for the passage of air from the outside to the interior thereof to support or urge the combustion of the gas or vapor therein, as more fully herein-

after explained in the description of the operation of the furnace.

D is an injector projecting downward through the top of the furnace. This is connected by a suitable pipe E with a gas or oil supply, by means of which gas or oil may be injected vertically into the fire-pot or retort below, the said injector being placed directly over the center of said pot or retort, so that injected gas or vapor will be diffused uniformly in the same.

Into the lower part of the combustion chamber, beneath the fire-pot, extends the pipe F through which air is injected into the space between the walls of the fire-pot and the walls of the combustion chamber, so that the injected air will be heated before entering the fire-pot, and, mixing with the injected gas or vapor in the retort will support the combustion thereof.

At the rear of the bridge-wall G, of the furnace, is located a reverberatory chamber H and from said chamber extends the eduction flue I for the escape of the products of combustion. Over the said chamber may be located a steam boiler or generator, or the intensely-heated products of combustion from the combustion chamber may be used directly in the reverberatory chamber H for metallurgical, cremating, or other purposes.

The operation of my invention will now be readily understood, in connection with the above description, and is as follows: A hydro-carbon fluid is admitted to the combustion chamber through the injector at the top and directed vertically downward and ignited. The flame impinges centrally against the interior of the fire-pot intensely heating the same, and also by radiation, the air in the blast pipe F. The air introduced from the blast, below, serves to support and urge combustion upon coming into contact with the gases generated in the fire-pot, and the whole intensely heated burning gases pass into the rear or reverberatory chamber where they may be applied for metallurgical, cremating or heating purposes.

Having now described my invention, what I claim is—

1. The combination, in a furnace for burning oil or gaseous fuel, of a fire chamber, a fire pot located therein and having a solid bottom and perforated sides, a chamber below  
5 said solid bottom into which the air to support combustion is admitted and an injector located above the fire-pot, the solid bottom serving to diffuse the fuel in the fire-pot and to superheat the air in the chamber below,  
10 substantially as described.

2. The combination, in a furnace for burning oil or gaseous fuel, of a fire-chamber, a fire-pot located therein having a solid bottom and perforated sides for the admission of air

to its interior, an air induction pipe located 15 beneath said solid bottom, an injector located directly over the fire-pot so as to project the oil or gaseous fuel directly upon the bottom of the fire-pot and thus diffuse it uniformly in said pot and superheat the air beneath the 20 bottom of the fire-pot, substantially as and for the purpose described.

In testimony whereof I affix my signature in the presence of two witnesses.

SAMUEL H. BROWN.

Witnesses:

FRANK S. OBER,  
JOS. J. UHL.