

(No Model.)

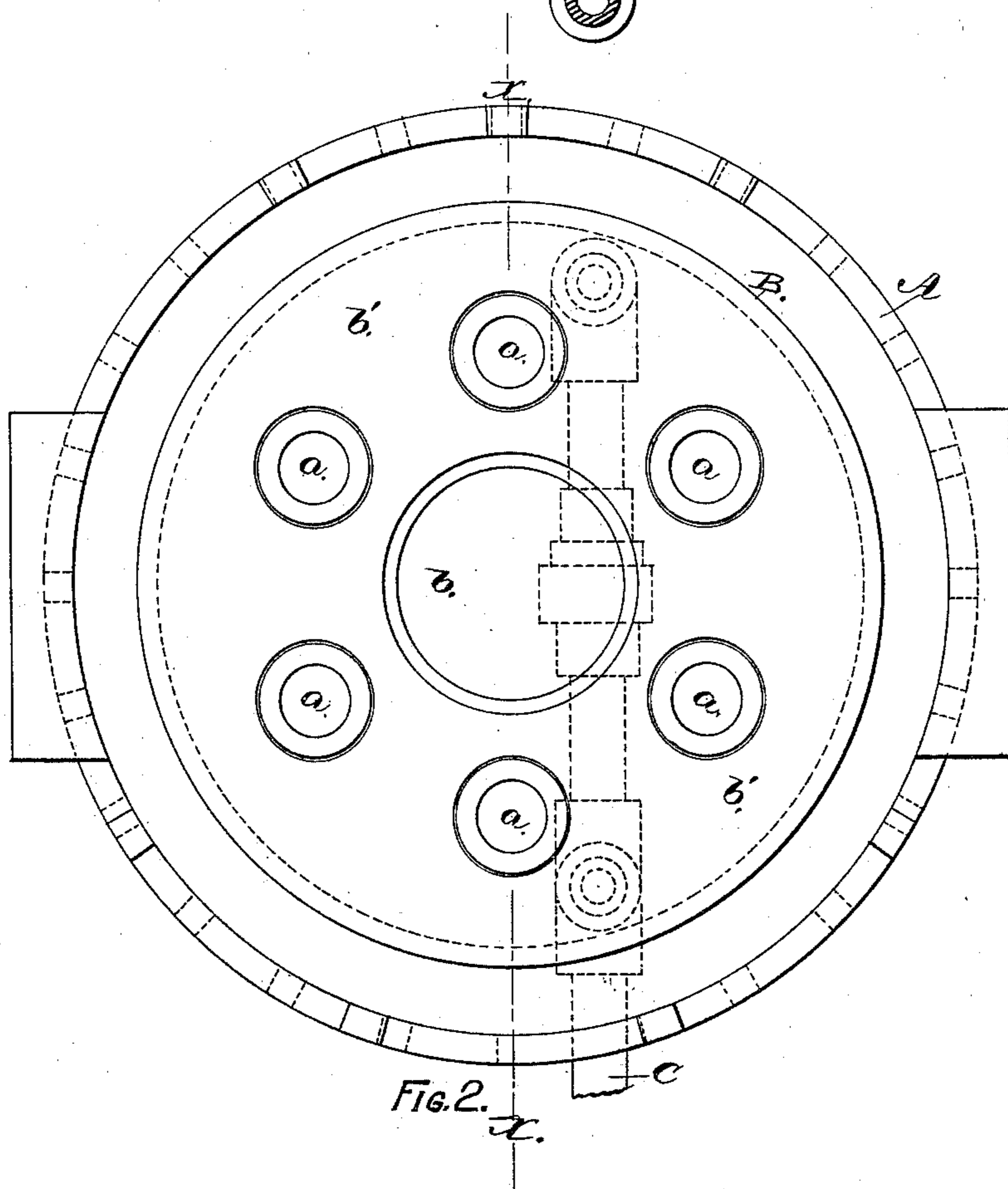
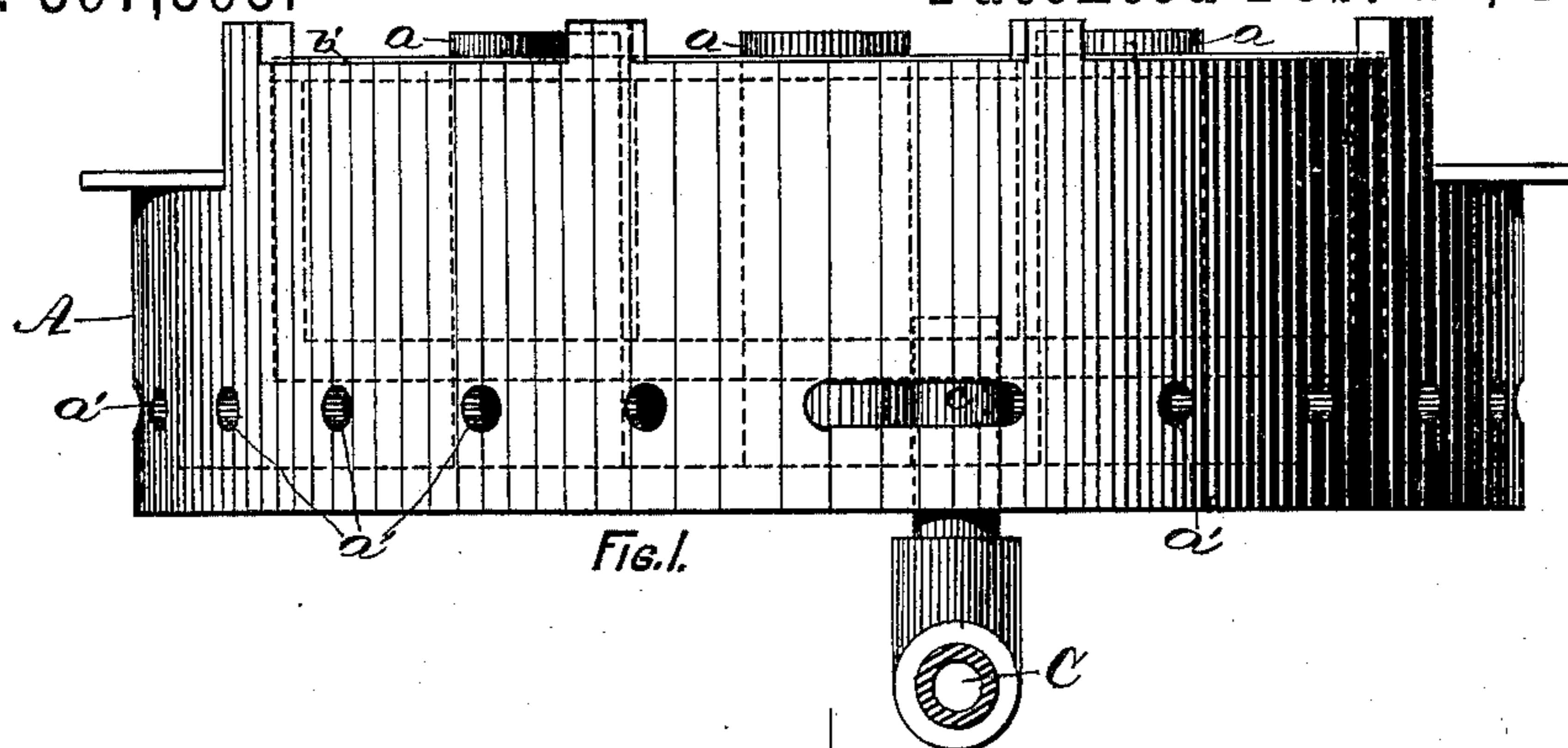
2 Sheets—Sheet 1.

W. T. KELLOGG.

BURNER FOR LIQUID HYDROCARBONS AND VAPORS THEREOF.

No. 397,595.

Patented Feb. 12, 1889.



Witnesses:

*S. B. Brown*  
*W. M. Brown*

Inventor:

*WARREN T. KELLOGG,*

*by William H. Low,*

*attorney.*

(No Model.)

2 Sheets—Sheet 2.

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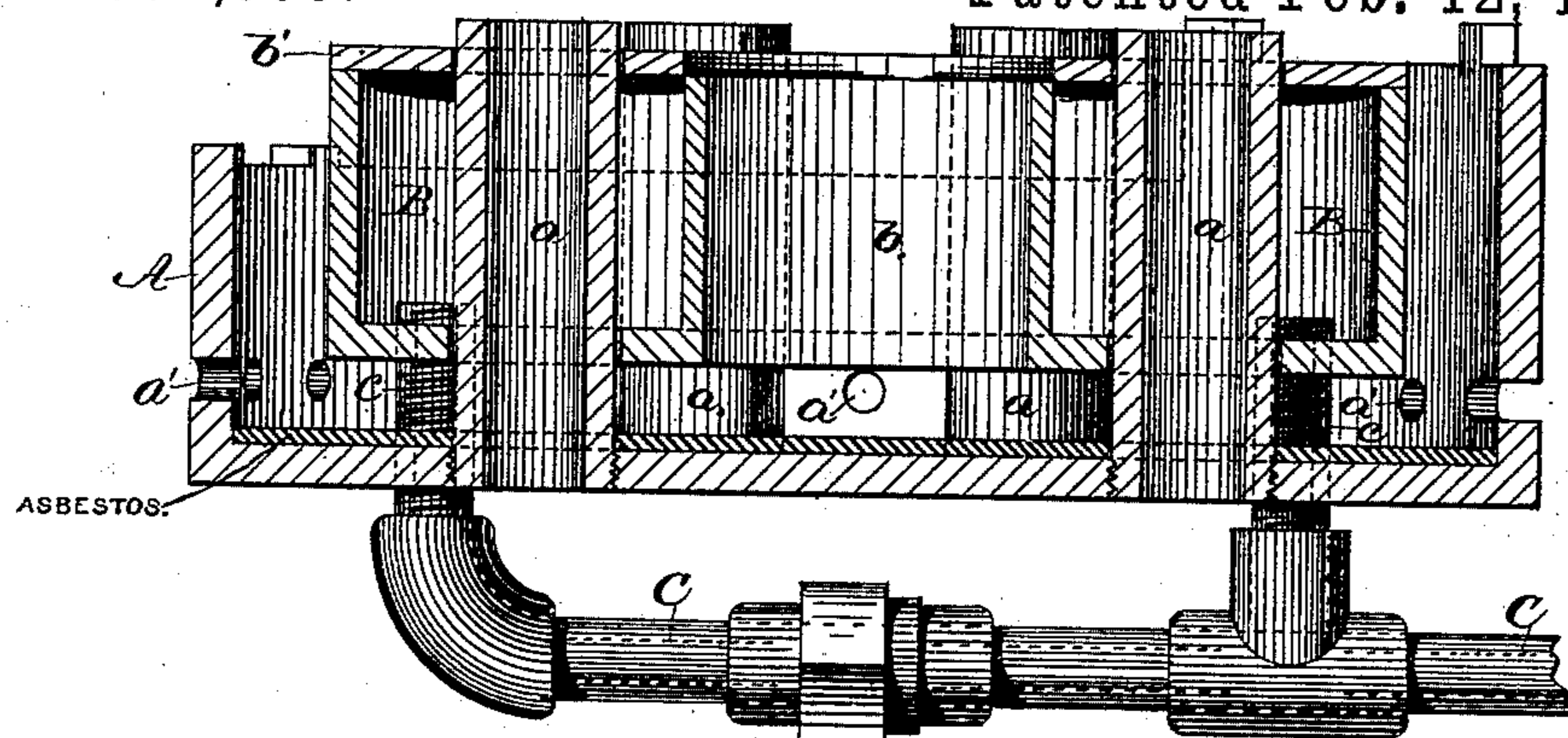


Fig. 3.

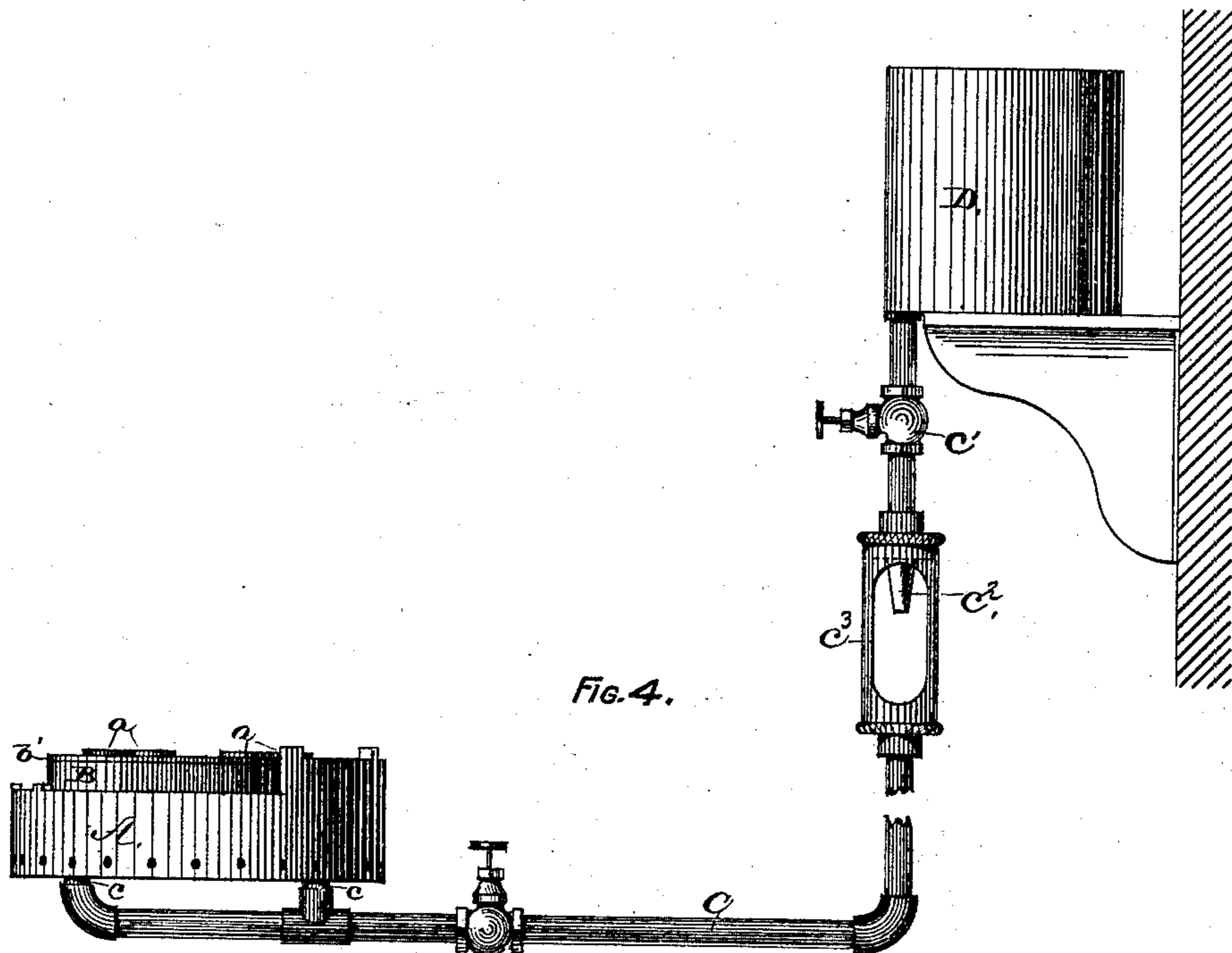


Fig. 4.

Witnesses:

J. B. Brewer,  
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Attorney.

# UNITED STATES PATENT OFFICE.

WARREN T. KELLOGG, OF LANSINGBURG, NEW YORK.

## BURNER FOR LIQUID HYDROCARBONS AND VAPORS THEREOF.

SPECIFICATION forming part of Letters Patent No. 397,595, dated February 12, 1889.

Application filed September 3, 1886. Serial No. 212,608½. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN T. KELLOGG, of Lansingburg, in the county of Rensselaer and State of New York, have invented new and useful Improvements in Burners for Liquid Hydrocarbons and the Vapors Thereof, of which the following is a specification.

My invention relates to improvements in apparatus for burning liquid hydrocarbons and other oils in furnaces where intense heat, without regard to illumination, is required; and the object of my invention is to afford means for the proper vaporization of the oils and for obtaining the necessary admixture of atmospheric air with said vapor to produce a more perfect combustion of the oils, and consequently the generation of a greater heat than is obtained by a direct combustion of said oils. This object I attain by means of the apparatus illustrated in the accompanying drawings, which are herein referred to, and form part of this specification, and in which—

Figure 1 is a front elevation of my burner; Fig. 2, a plan view of the same; Fig. 3, a vertical section at the line  $x x$  of Fig. 2; and Fig. 4 a reduced side elevation of my burner connected with its oil-supplying reservoir.

As represented in the drawings, A is the outer casing or shell of my burner, which is preferably made in the form of a circular pan and is provided with a series of air-tubes,  $a$ , whose openings extend through the bottom plate of said casing. Near the bottom of said casing its outer wall is perforated with a series of openings,  $a'$ , through which air is admitted to support the combustion of the oil contained in said casing, and in the bottom of the latter is placed a layer of asbestos, sand, or other material suitable for holding in suspension a quantity of oil in condition for burning.

B is a vaporizing-chamber or retort, which is fixed within the casing A in such manner that a clear space will be left between the bottoms and sides of said retort and the casing A. Said retort is provided with a central tube,  $b$ , which should be integral with the bottom plate of the retort, and by which an annular chamber is formed in said retort. An annular cover,  $b'$ , is fitted to close over the annular chamber of said retort, and said cover and the

bottom plate of the retort are both provided with suitable openings to permit the air-tubes  $a$  to pass through them without forming tight joints therewith. The retort B is supported within the casing A by means of the nipples  $c$  of the oil-supply pipe C. Said nipples are screwed into and through the bottom plate of the casing A and into the bottom plate of the retort B in such manner that the latter will be held at a sufficient distance from the surface of the oil-holding material at the bottom of the casing A to permit a proper combustion of the oil to be maintained beneath the bottom plate of the retort B.

D is an oil-reservoir, which may be fixed in any position that is conveniently near the burner, and at a sufficient height above the latter to insure the passage of the oil from said reservoir to the burner by the force of gravity. The vertical part of the oil-supply pipe C, which connects said reservoir with the burner, is provided with a supply-regulating valve,  $c'$ , which is located between said reservoir and a small nozzle or drip,  $c^2$ , through which the oil can be regulated to feed in as minute quantities as occasion may require. Said nozzle is contained in a gaging-cage,  $c^3$ , having glass sides, through which the nozzle can be readily seen, thereby affording means for visibly determining as to the sufficiency of the supply of oil that is being fed to the burner.

The several parts being constructed and arranged substantially as above described, the operation of my apparatus will be as follows: The oil from the reservoir D is fed through the supply-pipe C and passes through the nipples  $c$  into the interior of the vaporizing-chamber B. From the latter a portion of the oil drips through the loose joints around the air-tubes  $a$  into the lower part of the casing A, wherein it will be absorbed by the layer of asbestos, where it will be ignited, and by the heat generated by this primary combustion the oil contained in the vaporizing-chamber B becomes vaporized and escapes in a gaseous form from said chamber through the loose joints formed by the cover  $b$  around the air-tubes  $a$ , and as fast as this vapor or gas is emitted through said joints it becomes com-

mingled with the currents of air which pass up through air-tubes *a*, and this mixture, becoming ignited from the flame of the oil burning in the casing A, burns with an intensity  
5 of heat that is fully equal to that of the well-known Bunsen gas-burner. This burner is especially designed for use in the furnaces of steam-generators, caloric engines, and other apparatus where an intense heat is required;  
10 and it is obvious that its construction is not limited to the precise number of air-tubes and points of gas ignition shown in the drawings.

I claim as my invention—

1. The combination of a primary combustion-chamber provided with a series of vertical  
15 air-tubes which have a free opening through them from top to bottom, a vaporizing-chamber fixed within said combustion-chamber so as to leave a clear space between the sides and  
20 bottoms of the two chambers, the air-tubes of said combustion-chamber passing loosely

through the top and bottom plates of said vaporizing-chamber, and an oil-pipe arranged to deliver its supply of oil primarily into the vaporizing-chamber, as and for the purpose  
25 herein specified.

2. The combination, with a casing, A, provided with standing air-tubes *a*, and having a bottom layer of asbestos or other absorbent material, of a vaporizing-chamber, B, contained in said casing, and having the air-tubes  
30 *a* passing therethrough, so as to leave leaky joints around said tubes at the top and bottom of said chamber, and an oil-supply pipe, C, adapted to primarily feed the supply of oil  
35 into the vaporizing-chamber B, all being arranged to operate as herein specified.

WARREN T. KELLOGG.

Witnesses:

HENRY A. STRONG,  
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