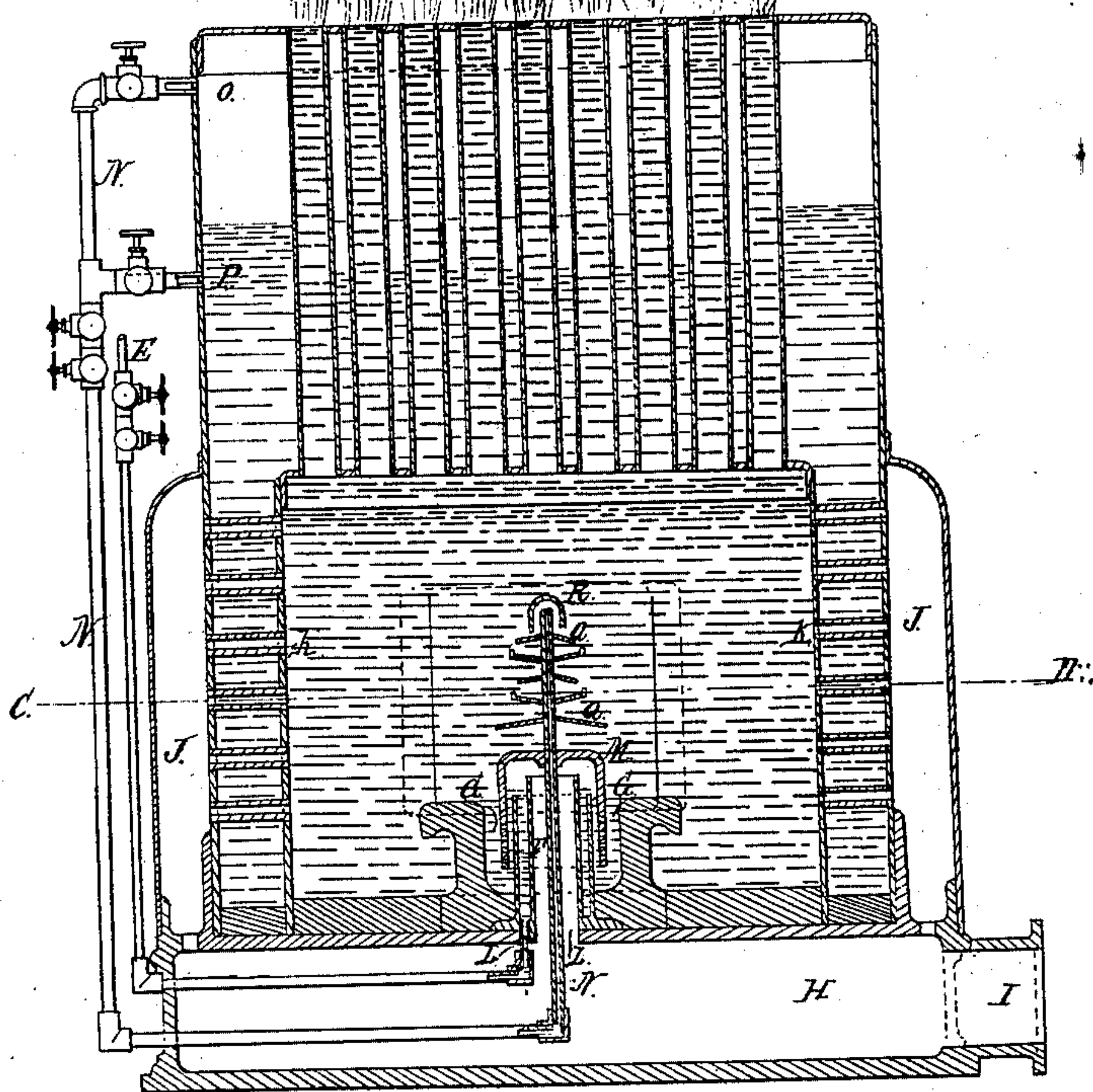
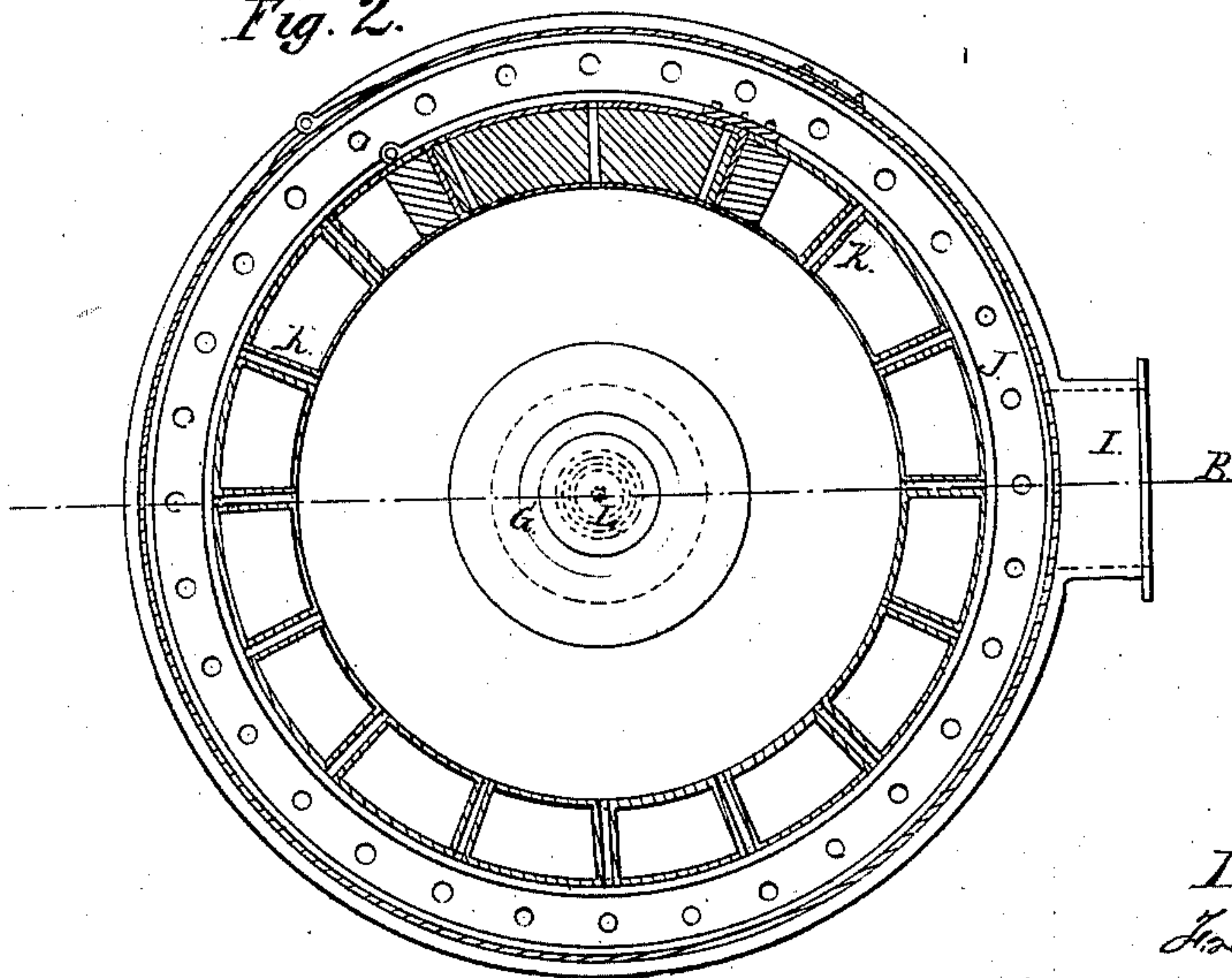


*F. Cook,*  
*Burning Hydrocarbon.*  
*N<sup>o</sup> 68,707.      Patented Sep. 10, 1867.*

*Fig 1.*



*Fig. 2.*



*Witnesses,*  
*J. A. Bussell*  
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*Inventor,*  
*F. Cook*



# UNITED STATES PATENT OFFICE.

FREDERIC COOK, OF NEW YORK, N. Y.

## IMPROVED METHOD OF BURNING HYDROCARBON OILS AS FUEL.

Specification forming part of Letters Patent No. 68,707, dated September 10, 1867.

*To all whom it may concern:*

Be it known that I, FREDERIC COOK, of the city, county, and State of New York, have invented a new and useful Method of Burning Hydrocarbon Oils as Fuel; and I do hereby declare the following to be a full, clear, and exact description of the same, referring to the drawings accompanying and making a part of the specification, in which—

Figure 1 is a vertical section through the line A B of Fig. 2, and Fig. 2 is a horizontal section through the line C D of Fig. 1.

In burning petroleum as fuel it is desirable to provide some means by which the oil, when first lighted, may burn with the proper admixture of air without smoke; and the object of this invention is to accomplish this result by an arrangement of water-evaporators in the furnace, by means of which, when the fire is first lighted, the water will be evaporated, and separate or disintegrate the gases and flame, and bring more air into intimate contact with them; and it further consists in forcing air, either heated or otherwise, through the oil, in order to burn the light products first.

The construction and operation of my apparatus are as follows:

The petroleum or other hydrocarbon is contained in an elevated tank, and conveyed to the cup F by the pipe E. It flows over the top of cup F and fills the cup G; overflowing the cup G, it burns as it flows over.

H is an air-chamber, into which I force air by means of a steam-blower through the nozzle I. The air enters the air-box J, which surrounds the boiler, and enters the fire-box through the air-pipes K, which are expanded into the water-legs of the boiler. A portion of the air enters the air-pipe L, which is open at the top.

M is a cap over the air-pipe L, having perforations at the lower end of its sides. This deflects the air down, and the air is forced through the perforations into the cup of oil,

and passes through the oil, disengaging the lighter gases, (especially where hot air is used, or when the oil is hot,) and carrying the vapors into the fire-box, where they are ignited.

N is a combined steam and water pipe, connected at O with the steam-space in the boiler, and at P with the water-space, each connection being furnished with a valve.

When the fire is first lighted, oil being let on, as soon as the plates Q Q are hot, the water-valve is opened, and a stream of water flows over the top of the pipe N against the inverted cup R; thence from plate to plate as it is evaporated by the heat of the burning oil into steam, and mixes with the air and gas as soon as the fire is lighted, which prevents the rapid accumulation of carbon—the great trouble with petroleum-burners hitherto used. When steam is raised the water-valve may be closed and the steam-valve opened.

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

1. The arrangement, substantially as described, by which water is supplied and evaporated by the plates Q Q, or their equivalents, when used for this purpose, substantially as set forth.

2. The cap M, arranged within the cup G, and perforated, as described, so that air may be forced through it, for the purpose and in the manner specified.

3. The pipe N, arranged as and for the purpose described, in combination with its two connections, one with the steam-space and the other with the water-space of the boiler.

4. In combination with the air-chamber J, the air-pipes K through the water-legs of the boiler, for the purpose of introducing air into the furnace, substantially as described.

FREDERIC COOK.

Witnesses:

J. A. BASSETT,  
EDM. F. BROWN.