(No Model.)

A. N. LEET.

HYDROCARBON FURNACE.

No. 306,934. Patented Oct. 21, 1884.

Fig. 1.

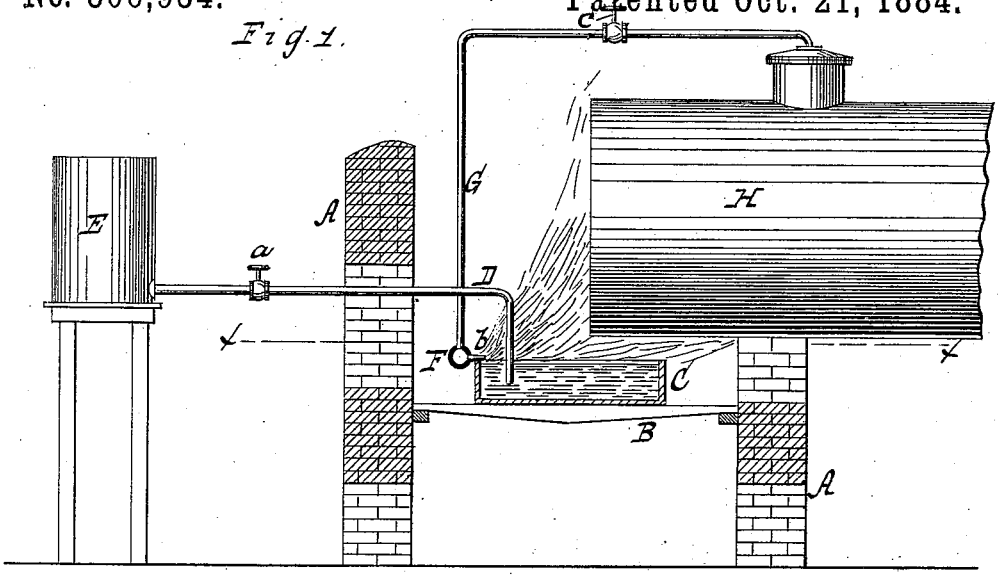
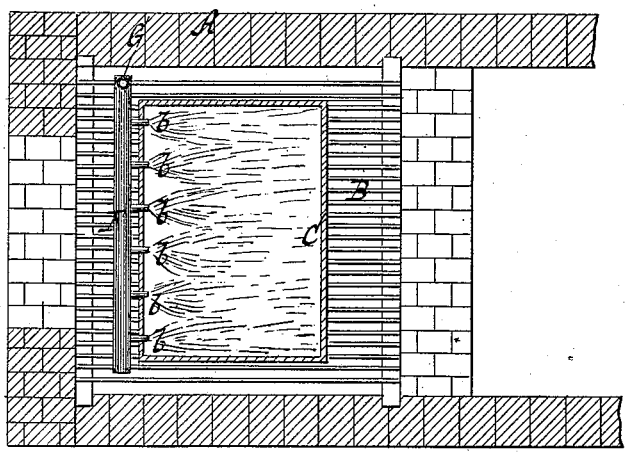


Fig. 2.



WITNESSES:

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ALLEN N. LEET, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO EMILIE NEUMANN, OF SAME PLACE.

HYDROCARBON-FURNACE.

SPECIFICATION forming part of Letters Patent No. 306,934, dated October 21, 1884.

Application filed February 2, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALLEN N. LEET, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Hydrocarbon-Furnaces, of which the following is a specification.

It is often desirable to use petroleum or hydrocarbon liquid as the source of heat in a steam-generator, as it is well known such liquids produce an intense heat on combustion, and are at the same time among the most economical sources of heat available for the purpose. Many devices have been proposed for the purpose, usually quite complicated, and precluding the use of any other source of heat. It also seems desirable, therefore, that some means should be provided for utilizing hydrocarbon liquids as the combustible under steam-generators which should not require any change in the construction of the ordinary combustion-chamber, but which can at will be placed therein for use or withdrawn therefrom.

The object of my invention is to provide such means; to which end it consists in the combination of devices more particularly hereinafter set forth and claimed.

In the drawings, Figure 1 represents a longitudinal vertical section. Fig. 2 is a horizontal section in the plane *x x*, Fig. 1.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the furnace-wall, which supports the fire-grate B, to which access can be had through a door, and beneath which is the ordinary ash-pit, which is open, so that the atmospheric air can pass freely into it. On the grate is placed a pan, C, of iron or any other suitable material, and this pan is supplied with petroleum or other hydrocarbon liquid through a pipe, D, which extends from a tank, E. The supply of hydrocarbon liquid is regulated by a stop-cock, *a*. The pipe D is by preference made to extend down near to the bottom of the pan, so that the flame is not liable to pass into said pipe.

In front of the pan C is situated a tubular head, F, which is provided with a series of nozzles, *b*, which may rest upon the edge of the pan, as shown, so that they sustain the head F, or which may be arranged in any other manner, so that jets of steam injected through them will sweep over the surface of the liquid contained in the pan. The head F connects, by means of a pipe, G, with a steam-generator, H, and this pipe is provided with a stop-cock, *c*, so that the supply of steam to the head F and nozzles *b* can be regulated. This head F, being of larger section and capacity than the supply-pipe, furnishes a chamber in which the pressure of the steam is equalized, so that it may issue from all the nozzles with equal and controllable force.

If the furnace is to be used for a steam-boiler, an additional steam-pipe must be provided, which connects with a supplementary steam-generator, and which supplies steam until the boiler H has been heated to the required temperature to produce steam. When the pan C has been supplied with a sufficient quantity of hydrocarbon liquid, this liquid is ignited, and then the steam-pipe G is opened. By means of the jets of steam the flame of the hydrocarbon liquid is spread, a large quantity of atmospheric air is caused to rush in from below, and the flame becomes very powerful and intensive, so that a great heat is produced with a comparatively small expenditure of fuel. It will be noticed that the use of these devices necessitates no change in the combustion or fire chamber, it remaining unchanged and ready for use with other combustibles when desired.

To use this device it is simply necessary to set the pan upon the grate-bars and make the pipe-connections D and G, while to use coal or other combustible it is simply necessary to remove the pan and unscrew the pipes D and G at the cocks *a* and *c* or other convenient points—the work of but a moment, not requiring any amount of technical skill nor the aid of tools beyond a mere wrench.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the furnace-grate, of an open pan adapted to be placed therein, a pipe leading into the pan and connecting it with a tank or supply of hydrocarbon liquid, a tubular head situated in close proximity and parallel to the pan, and of larger capacity than its supply-pipe, a series of nozzles projecting therefrom, and a pipe connecting the

tubular head to a source or supply of steam, substantially as described.

2. The combination, with a furnace-grate, of an open pan seated or placed on the grate and adapted to contain a hydrocarbon liquid for combustion therein, a tubular head in proximity to and parallel to the pan, a pipe connecting this head to a supply or source of steam, and a series of nozzles projecting from said head and resting upon the edge of the pan, whereby the tubular head is supported and jets of steam forced over the surface of the liquid in the pan, the whole forming a readily removable or replaceable device for burning hydrocarbons under furnaces, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

ALLEN N. LEET. [L. S.]

Witnesses:
W. HAUFF,
CHAS. WAHLERS.