(No Model.)

A. H. SHIPMAN.

HYDROCARBON FURNACE.

No. 353,169. Patented Nov. 23, 1886.

Fig. 1.

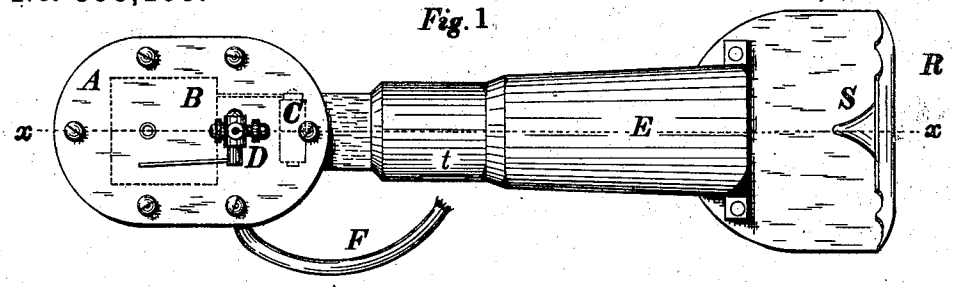


Fig. 2.

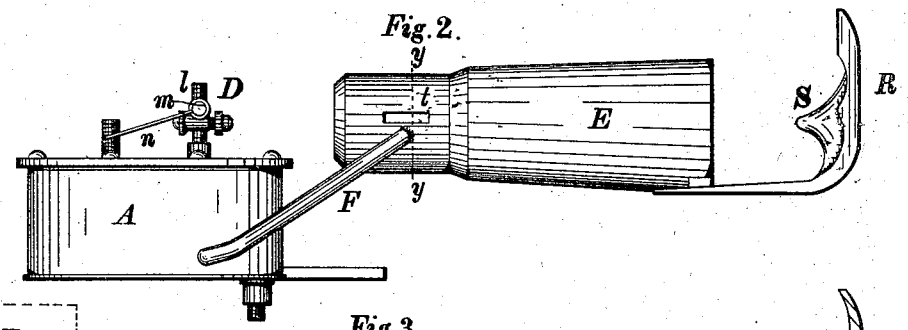


Fig. 3.

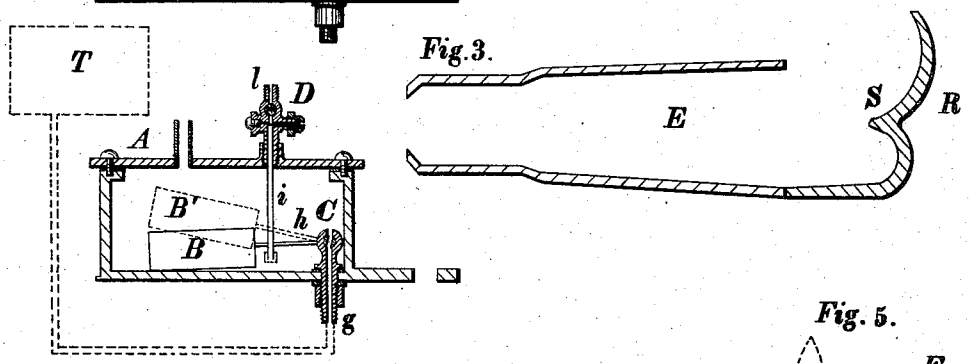


Fig. 5.

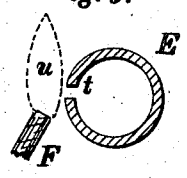
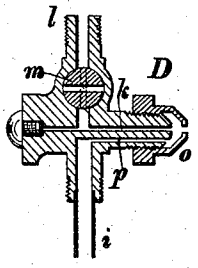


Fig. 4.



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HYDROCARBON-FURNACE.

SPECIFICATION forming part of Letters Patent No. 353,169, dated November 23, 1886.

Application filed August 2, 1884. Serial No. 139,460. (No model.)

To all whom it may concern:

Be it known that I, ALBERT H. SHIPMAN, of Rochester, in the county of Monroe, in the State of New York, have invented certain Improvements in Hydrocarbon-Furnaces, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to certain improvements in hydrocarbon-furnaces, having for its object the maintenance of the flame in the apparatus described in my Patent No. 304,365, dated September 2, 1884, by lighting the same when extinguished by accident or by the operation of the devices covered by the said patent, and consisting in the provision of a wick-tube connected to an oil-reservoir in such relation to the oil-spraying devices and combustion-tube that the jet of mixed steam and oil will be ignited by the independent flame of the wick-tube in case it becomes extinguished.

My invention also consists in certain devices by which the independent flame of the wick-tube is protected from currents of air in the combustion-tube caused by the burning of the jet of sprayed oil therein.

My invention is described and illustrated in the following specification and accompanying drawings, and the novel features thereof claimed in the claims annexed to the said specification.

My improvements in hydrocarbon-furnaces are illustrated in the accompanying drawings, in which Figure 1 is a plan view. Fig. 2 is a side elevation. Fig. 3 is a central longitudinal section on the line *x x*, Fig. 1. Fig. 4 is a section through the atomizing-jet on an enlarged scale. Fig. 5 is a transverse section through the combustion-tube on the line *y y*, Fig. 2.

In the accompanying drawings, A is an oil-reservoir in which the quantity of oil is regulated by a float, B, controlling a valve, C. D is the steam oil-atomizing jet, E the combustion-tube, and F a wick-tube connected with the oil-reservoir and serving to maintain a flame at its upper end for the purpose of igniting the current of sprayed oil and steam emerging from the atomizer when accidentally extinguished.

The oil-reservoir A may be of any preferred size or construction. I generally arrange it to receive a supply of kerosene or other suitable hydrocarbon oil from a large supply-reservoir, T, (shown in the drawings by dotted lines,) through a pipe, *g*, the supply-reservoir being arranged on a higher level, so that the liquid will flow in the pipe into the reservoir A, the quantity therein being controlled by the float B, which rises, as indicated at B', Fig. 3, and closes the valve C on the inner end of the pipe *g*. The float is connected with the valve by a lever, *h*. From the reservoir the oil is drawn upward through the pipe *i* by the discharge of steam from the boiler through the passage *k* in the atomizing-jet D. Steam is supplied to the atomizer through the tube *l*, which is provided with a valve, *m*, having handle *n*.

The construction of the atomizer which I prefer to use will be readily understood from an examination of the sectional view, Fig. 4.

The end of the atomizer is provided with a screw-cap, *o*, having a central orifice through which the mixed jet of steam and sprayed oil emerges. The oil is drawn through the passage *p* from the pipe *i* by the action of the steam. The quantity of oil burned may be regulated by screwing the cap *o* on and off the atomizer. Any other form of atomizer may, however, be employed.

From the atomizer the burning jet of mingled steam and oil spray passes through the combustion-tube E and is by it directed under the boiler or other object to which it is desired to apply heat. The reservoir A and the combustion-tube should be supported in the proper relations with each other and the object to be heated by suitable devices.

As shown in the drawings, the combustion-tube is provided beyond its open end with a curved deflector, R, having a central cone, S, projecting inward therefrom, the object of which is to turn the flame upward and make it wider, so that it may be applied more effectively to the object to be heated. The combustion-tube is provided on one side with an opening, *t*, through which the flame *u* at the end of the wick-tube ignites the combustible jet from the atomizer in case it becomes extinguished from any cause. As will be observed in Fig. 5, the end of the wick-tube is placed slightly below the opening *t*, so as to prevent

the flame *u* from being extinguished by a current of air produced by the combustion in the tube.

I claim—

1. The combination, with the reservoir A, of the atomizer D, combustion-tube E, and wick-tube F, substantially as and for the purposes set forth.

2. The combination, with the oil-reservoir A, provided with the atomizer D, float B, and valve C, of the combustion-tube E, wick-tube F, and supply-reservoir T and connecting-pipe *g*, substantially as described.

3. The combination, with the steam oil-spraying device D, of the combustion-tube E, provided with an opening, *t*, and having a wick-tube, F, arranged outside of the combustion-tube to maintain a flame which operates to light the jet from the atomizer, substantially as described.

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