J. C. RAMSDEN.

HYDROCARBON FURNACE.

No. 169,842. Patented Nov. 9, 1875.

FIG 1

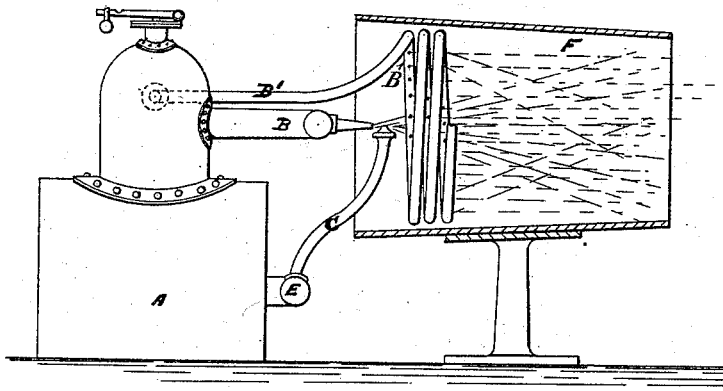


FIG. 3.

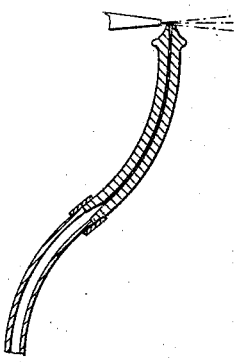
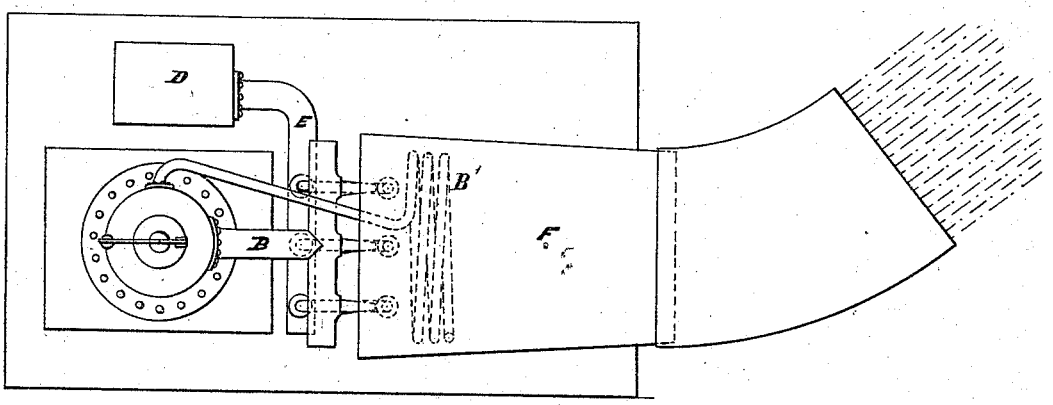


FIG 2



Witnesses

Walter Brierley

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JOHN CARTER RAMSDEN, OF LIGHTCLIFFE, ENGLAND.

IMPROVEMENT IN HYDROCARBON-FURNACES.

Specification forming part of Letters Patent No. 169,842, dated November 9, 1875; application filed April 10, 1875.

To all whom it may concern:

Be it known that I, JOHN CARTER RAMSDEN, of Lightcliffe, in the parish of Halifax, in the county of York, England, silk-manufacturer, have invented certain Improved Apparatus for Generating and Applying Heat and for Generating Steam; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for its objects the construction of portable apparatus for generating and applying heat.

The fuel used in this my improved method and apparatus is water in a state of steam or vapor, and some or one of the volatile hydrocarbons, of which paraffine and petroleum are a type; and this invention consists in an improved apparatus for effecting the union and combustion of the said fuels, and this is accomplished as follows: Attached to a small boiler or steam-generator, which can be of any convenient size, and heated by any means, I fix a number of horizontal tubes, more or less, in accordance with the size of the boiler or steam-generator. These tubes terminate with minute orifices, so that the water, when formed into steam, rushes out in a fine spray. Underneath these said horizontal tubes I attach vertical tubes. The lower part of these tubes, or some or one of them, takes into a trough or reservoir containing some or one of the liquid hydrocarbons. The upper portions of these vertical tubes terminate in a capillary orifice.

The *modus operandi* is as follows: When the water is converted into steam it is discharged with considerable force through the horizontal tubes, the vertical tubes are exhausted, the volatile hydrocarbon rises to fill the vacuum, and, reaching the capillary orifices at the top, is caught by the rushing column of steam and blown into the finest spray, the result of which is that an intimate union of the two liquids is effected, a light is applied, and combustion at once takes place. An immense heat is generated with a complete absence of smoke.

As before stated, this apparatus can be made of any convenient size. It is portable, and can be moved about from place to place, and can be applied with great advantage to a variety of purposes—to the melting of metals, to the rapid raising of steam, or supplying clean hot dry air to any or every conceivable purpose. This apparatus will be found of very great value.

In order that the invention may be fully understood, I have hereunto annexed a sheet of drawings illustrating the construction and arrangement of the apparatus; its working or operating is hereinafter fully explained.

Figure 1 is a section of a portable apparatus constructed and fitted with appliances for consuming liquid fuel according to this invention. Fig. 2 is a plan of Fig. 1, and Fig. 3 is a section of the capillary tube.

A is the small boiler or steam-generator, to be heated by gas, spirit, lamp, or fire, as convenient, and in accordance with the size of the steam-generator required. B B are horizontal steam-tubes, terminating with minute orifices at the discharge end. C C are the petroleum-tubes, supplied from the reservoir D by way of the pipe E. The tubes C C, as shown at Fig. 3^1, are capillary tubes, and to facilitate the construction of these pipes they may, as shown by the drawing, be made in two lengths.

The oil I prefer to be used is the volatile spirit or refined oil of petroleum obtained from the first distillations.

The steam discharged from the orifices of the pipes B B across the orifices of the capillary tubes C C exhausts the air therefrom, causing the petroleum spirit to ascend to the outlet, whereon it is caught by the current of steam and blown or carried off along with the steam in the form of a vapor or fine spray. An intimate union of the two is effected, which, on the application of a light, at once ignites, the combustion of the two fuels giving off an intense heat, which is further augmented by the steam discharged from the coiled perforated steam-pipe B′, for it must be understood

that one of the pipes C C, giving out spirit from a capillary tube, will decompose and consume water in the form of steam from several orifices equal to that of the spirit-tube's orifice, and there is a complete absence of smoke.

F is a case or tube, which may be straight or curved, for directing or diverting the heat and flame to any required point or object. The case or tube F will not be required where the heat is applied direct to an inclosed space, such as a furnace for the smelting, the heating, and the melting of metals, heating a boiler, or boiling liquids, for drying purposes, heating singe-plates, and other like uses.

When there is a supply of steam at hand the steam-generator A will not be requisite. A connection between the pipes B B and the source of the steam-supply will obviate the necessity of the use of the generator.

I claim—

The combination of the steam-pipes B and capillary tubes or pipes C with the perforated steam-pipes B′ and the short straight cylinder F, substantially as and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of June, 1874.

J. C. RAMSDEN.

Witnesses:

WALTER BRIERLEY,

ROBERT NEWTON.