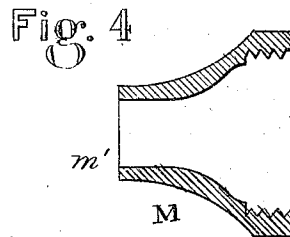
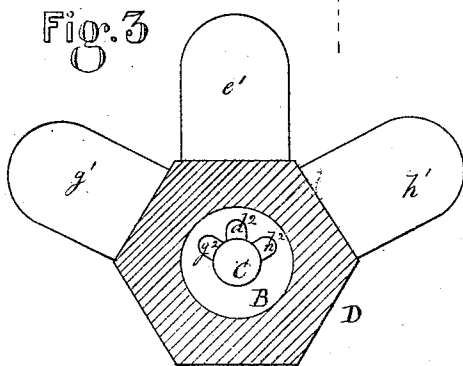
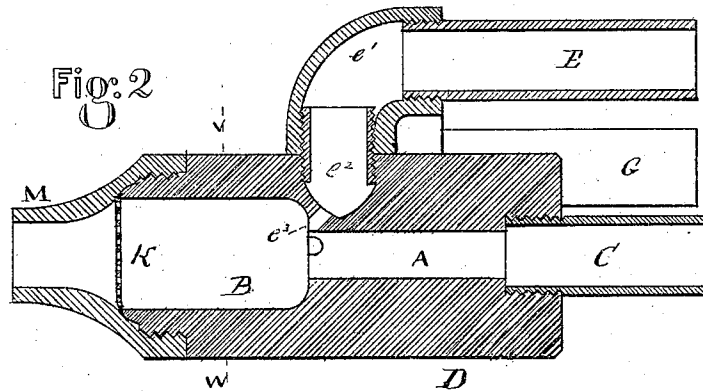
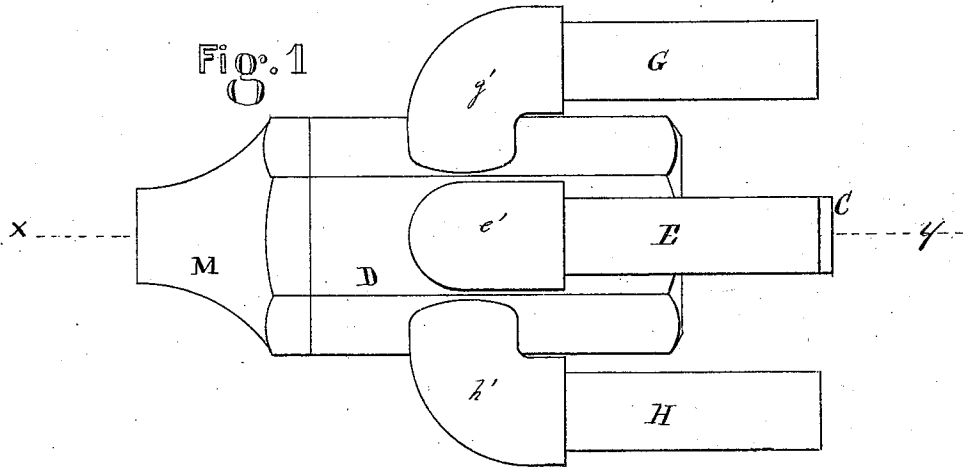


I. KENDRICK.

Improvement in Apparatus for Burning Hydrocarbons.

No. 132,839.

Patented Nov. 5, 1872.



Witness { Edw. Brown
John A. Grant

I. Kendrick

UNITED STATES PATENT OFFICE.

ISAAC KENDRICK, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR BURNING HYDROCARBONS.

Specification forming part of Letters Patent No. 132,839, dated November 5, 1872.

To all whom it may concern:

Be it known that I, ISAAC KENDRICK, of Philadelphia, Pennsylvania, have invented an Improvement in Atomizing Hydrocarbon Liquids and combining the same with steam, air, or water, of which the following is a specification:

The nature of my invention consists in the construction of an apparatus of iron or other metal by means of which the oils of creosote, shale, petroleum, and other hydrocarbon liquids may be atomized and combined with superheated or dry steam and air, or with water and air, as may be preferred; also, in the process of commingling hydrocarbon liquids and water and atomizing them by the force of compressed air, which may be accomplished by the apparatus described herein. The machine itself may be briefly described as consisting of two communicating chambers, one of them large, the other comparatively small, the walls of which are perforated with holes or openings which are made to enter at the junction of the two chambers, through which oil and air or oil and water are admitted into the larger chamber.

Referring to the drawing making part of this specification, Figure 1 is a plan of my apparatus. Fig. 2 is a longitudinal section on the line xy . Fig. 3 is a cross-section on line vw . Fig. 4 is a section through the nozzle.

My apparatus consists of two communicating chambers, the one, B, large, the other one, A, comparatively small. A pipe, C, is screwed into the end of chamber A, through which steam or compressed air is admitted. The outside of the casting D containing these chambers is hexagonal in section, as shown in Fig. 3, and on the three upper sides has three inlet-pipes, E G H, fitted to it. The casting D is first drilled nearly through at e^2 , and from the bottom of this hole a smaller hole, e^3 , is drilled at an angle of about forty-five degrees. This hole opens into the chamber B just at the junction of the two chambers. One half of the hole is shown in chamber A, the other half in chamber B. The hole e^2 is tapped with a screw for attaching the pipe E by the short elbow e^1 . Two other similar pipes, G H, are fitted to the casting D, with inlets similar to that of pipe E. Over the end of chamber B is placed a piece of wire-gauze, K, held in place by the nozzle

M or otherwise. This nozzle, shown detached in Fig. 4, varies in size at the orifice m' for the purpose of enlarging or reducing the discharge of vapor from the same.

The operation of the apparatus is in this manner: First, superheated or dry steam, under pressure, is admitted into the pipe C. From thence it passes into chamber A and issues with considerable force into chamber B. At the same time oil is admitted through one or more of the pipes G E H. As the oil passes out of the hole e^3 , either by its gravity or the impelling current of steam, it is, by the force of the steam, atomized, combined, and converted into hydrocarbon vapor within the chamber B. The oil, being admitted at the junction of the small chamber with the larger one, is free to expand immediately on entering, and thus relieve the pipe E of any back pressure. Secondly, in combination with the hydrocarbon-oil, which is admitted through one or more of these pipes, I use one of them as an inlet for air, so as more effectually to prepare the gases for immediate ignition as they issue from the nozzle of chamber B. Usually I admit oil through the two pipes G and H and air through the pipe E, the proper supply being regulated by cocks in the said pipes. Thirdly, compressed air from a holder in lieu of the superheated steam is admitted, through chamber A, into chamber B. Oil is admitted through pipes G and H, as formerly, and water through pipe E. In this arrangement the oil and water are disintegrated and commingled together in chamber B, and pass out from thence by pressure, through the outlet, to a fire-place or furnace for purposes of fuel.

In the first and second mode of operation the steam is made to supply the necessary equivalent of hydrogen; and in the third mode the water furnishes the necessary supply during the process of combustion.

When, from a deficiency of pressure, it is desirable, for the purpose of more effectually breaking up and commingling together the oil, steam, and air, or oil, air, and water, I place at the outlet of chamber B a netting of wire or perforated sheet metal, K, secured in position by the nozzle A when attached, or otherwise.

It is not essential that the chamber B should be rectangular in form. It may be globular or

oval, provided the enlargement increases rapidly from the point at which the oil is admitted. Neither do I limit myself to the three tubes G, E, and H, here shown; more may be used when necessary. The nozzle M may also be dispensed with, and the vapor burned as it passes from the chamber B.

The advantage claimed by the use of my device is in the simple and economical mode of utilizing the excess of carbon and other inflammable properties of the hydrocarbons and converting them into hydrocarbon vapor for purposes of fuel.

I do not claim, broadly, the process of forcing oil and water into the furnace by means of steam, or of forcing oil and steam into the furnace by means of air.

What I claim is—

1. The double communicating chambers A and B, in combination with the inlet-holes g^2 h^2 , arranged to enter at the junction of the two cylinders, as and for the purpose herein described.

2. The wire-gauze K, placed at the outlet of chamber B and intermediate between the said chamber and the outlet of nozzle M, as and for the purpose herein described.

3. The process of commingling hydrocarbon liquids and water and atomizing them by the force or pressure of compressed air for purposes of fuel, as herein set forth.

I. KENDRICK.

Witnesses:

EDWD. BROWN,
JOHN F. GRANT.