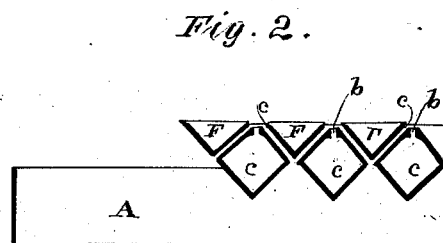
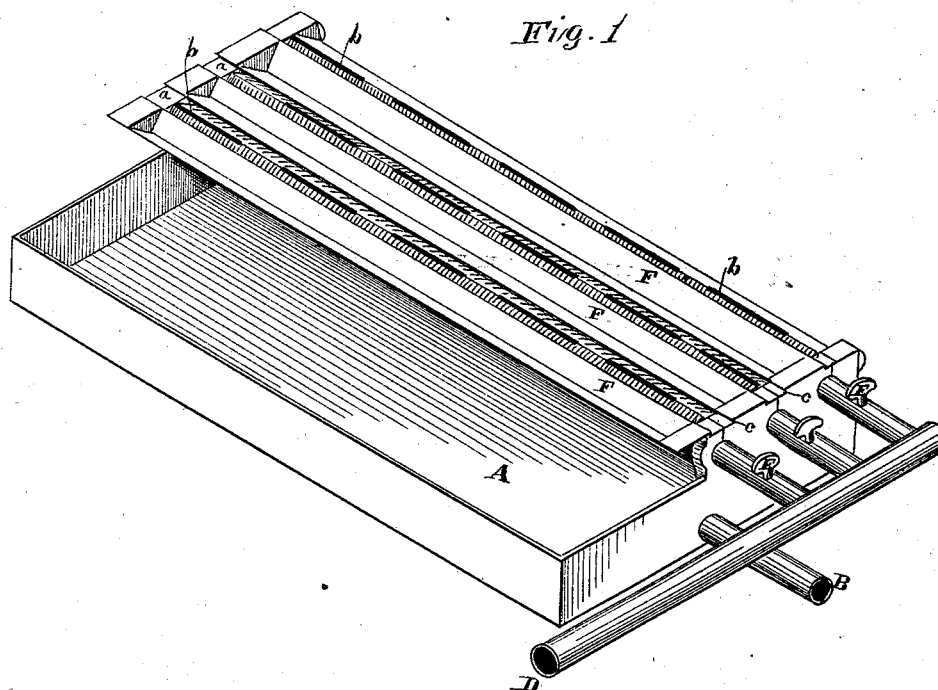


H. H. EAMES.
Hydrocarbon Vapor Burner for Heating Purposes.
No. 216,562. Patented June 17, 1879.



Witnesses

Geo. H. Strong
Frank A. Brooks

Inventor

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UNITED STATES PATENT OFFICE.

HENRY H. EAMES, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN HYDROCARBON-VAPOR BURNERS FOR HEATING PURPOSES.

Specification forming part of Letters Patent No. **216,562**, dated June 17, 1879; application filed December 18, 1878.

To all whom it may concern:

Be it known that I, HENRY H. EAMES, of the city and county of San Francisco, and State of California, have invented a Hydrocarbon-Vapor Burner for Heating Purposes; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to that class of burners for gases such as are used for the combustion of vapors and gases from hydrocarbons, and which are more especially adapted for heating purposes; and my improvements consist in constructing in a confined space, such as the fire-box of a boiler, a series of bars or pipes, in the upper part of which are elongated slots, through which the gas or vapor passes from said pipes or bars. Between each pair of bars is a V-shaped diaphragm or deflector, that will cause the current of air driven in below the pipes to impinge on each side of the slot or opening through which the gas or vapor issues.

The slotted openings are made to alternate with each bar, so that the flame, a short distance above the slots, extends in a sheet by striking against the boiler or other surface to be heated, and is not concentrated at points on said surface.

By this method of burning the gas the combustion is more perfect and the quantity of flame is increased. The flame is, moreover, more easily distributed and not concentrated, as is the case when the burner is made in concentric rings.

The hydrocarbons are vaporized before being led to my improved burners by suitable means, and a complete combustion of the gas or vapor is insured by the peculiar construction of the burners.

Figure 1 is a view of my device, and Fig. 2 is a section.

Let A represent the blast-box, which would occupy the position usually assigned to an ash-box in a boiler or furnace. This blast-box is placed under the object to be heated, and a blast of air is led into it from a pressure-blower through the pipe B.

Across this blast-box A extends a series of slotted hollow bars or pipes, C, a short distance

apart, and each being independently connected with the supply-pipe D, through which the vapor or gas is led from a receiver. These bars I prefer to make in halves and bolt the halves together, as shown at *a*, so that said bars or pipe will then be square in shape and set so that the slotted edge will come uppermost, as shown. The outer ends of these pipes are closed; but the other ends are open and connect with the supply-pipe, as described, a valve or cock, E, being placed in each near the supply-pipe, so as to control the flow of gas to each separate pipe. The slots *b* are made at the apex of the four-sided pipe, and are formed so as to alternate in one pipe and the next.

Between each pair of pipes is a diaphragm or deflector, F, which I preferably make in a V shape, to correspond with the shape of the burner-pipe. The sides of these deflectors come up on each side of the burner-pipes, as shown, a space, *c*, being left between each pipe and deflector for the whole length of each, through which the air may pass from below.

The operation of my device is as follows: The hydrocarbon vapors or gases are admitted to the pipes C by means of the valves from the supply-pipe, and said gas lighted. A blast of air is admitted to the blast-box or ash-pit from the pipe B. The air in the confined blast-box passes up between the deflectors and pipes, and escapes through the spaces *c*. In doing this it impinges on each side of the flame caused by the burning gas issuing from the slots in the pipes C, and furnishes a copious supply of air to said flame. In blowing on both sides of the flame from underneath, as it were, said flame is extended upward, and, by coming in contact with the surface to be heated over it, is spread in a broad continuous sheet over said surface. Each slot in each pipe is a separate burner in itself, and each burner has its supply of air fed on both sides of the flame through the space *c*, as described.

In applying this blast of air in the manner described, I not only utilize it in furnishing an abundant supply of oxygen, but it also forms a suction-draft to draw the heavy hydrocarbon vapors more rapidly to the burners.

In this manner a perfect combustion of the hydrocarbon vapors is accomplished, and a

broad continuous sheet of flame is applied to the surface to be heated. Each separate pipe, with its accompanying burners or slots, is under control by means of its valve connecting with the supply-pipe, and the supply of gas to each can therefore be regulated at will.

I am aware that heretofore liquid hydrocarbons have been burned in a fire-box through the medium of a series of cylindrical pipes having coincident perforations and arranged beneath deflectors, the combustion commencing below the deflectors.

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

In a furnace hydrocarbon-burner, the combination of a blast-box, A, a series of transverse burners, provided with alternating slots *b b*, and a series of intermediate deflectors, corresponding in outline to said burners, substantially as set forth.

In witness whereof I have hereunto set my hand.

HENRY H. EAMES.

Witnesses:

CHAS. G. YALE,

FRANK A. BROOKS.