(No Model.)

H. A. BRADLEY.

HYDROCARBON BURNER.

No. 570,450. Patented Nov. 3, 1896.

Fig. 1

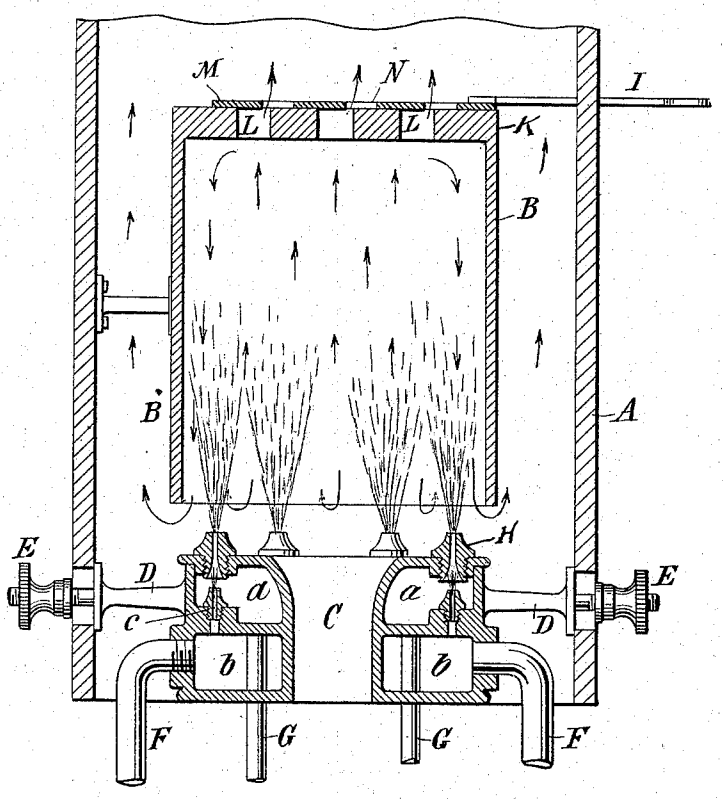
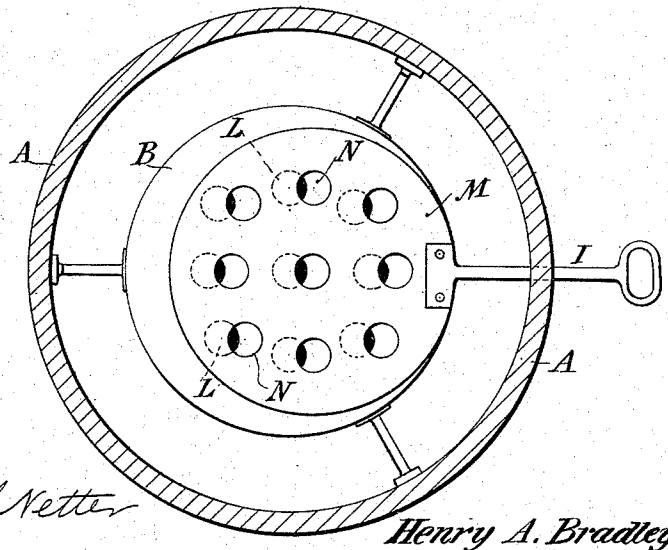


Fig. 2



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UNITED STATES PATENT OFFICE.

HENRY A. BRADLEY, OF NEW YORK, N. Y.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 570,450, dated November 3, 1896.

Application filed March 25, 1896. Serial No. 584,732. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. BRADLEY, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

In prior patents granted to me, among which I may mention No. 217,259, dated July 8, 1879, and No. 322,676, dated July 21, 1881, I have shown and described devices for producing and burning a hydrocarbon gas, which may be described as consisting, essentially, of a casing or generator formed with two chambers or compartments, into one of which either a liquid or dry carbon fuel is introduced and into the other steam. Nozzles open from the steam-chamber into the fuel-chamber, and orifices are formed directly in line with such nozzles through which the jets of steam escape, carrying with them a regulated proportion of the fuel, which, if sufficient heat is present or applied to the generator, issues as a fixed gas, which may be either burned at once or conveyed off, cleaned, and stored. These and similar devices are largely used as burners under boilers for glass-furnaces, smelting-pots, and various other analogous purposes, and for such purposes have proved remarkably effective; but their efficiency largely depends upon the degree of heat applied to the generator in which the fuel and steam are brought together to form the fixed gas, and it has heretofore been proposed to direct upon or through the generator heat developed externally or independently of that due to the combustion of the gas emitted and also to employ plates or burners of various kinds to deflect the heat back upon the generator; but such devices have not proved effective and they moreover involve the use of independent structures. It is with the object of utilizing more economically and effectively a portion of the heat developed by the burner itself that I have devised the combination which constitutes the subject of my present application for Letters Patent.

In carrying out my invention I place either the particular generator and burner hereinbefore referred to or one of substantially like character under a kind of hood within the fire-box or chamber in which combustion of the gas takes place, providing in any proper manner for the relative adjustment of the burner and hood, whereby the former may be moved more or less up into the latter, according to the temperature which in particular cases it may be desirable to impart to the generator and burner. The top of the hood is perforated or provided with passages, which also I prefer to make adjustable, so that a portion of the ignited gases is deflected backward upon the generator, raising it to a very high temperature.

As the specific form or construction of the device constituting my improvement may be very greatly modified without departure from the invention, I have given in the drawings hereto annexed, in illustration of the improvement, a simple and typical form of the same.

Figure 1 is a central vertical section of my improved apparatus, and Fig. 2 is a top plan view of the same.

The drawings show only the parts directly composing the novel combination of the improvement. For example, A designates a portion of a fire-box or combustion-chamber of any kind, over which there may be a boiler, melting-pot, or the like. Within this chamber is mounted the generator and burner C, which consists in this particular case of an annular iron box or casing with two compartments, one, *a*, for oil introduced by pipes G, the other, *b*, for steam introduced by pipes F. Nozzles *c* open into the compartment *a* from compartment *b* and the jets with the oil or vapor which they take up issue through the nozzles H.

The generator is shown as supported by rods D, passing through vertical slots in the side walls of the chamber A, and provided with wing-nuts E. This means is intended to provide for the vertical adjustment of the generator, although any other suitable means may obviously be employed.

Above the generator C is a hood, preferably cylindrical in form, supported by brackets on the sides of the chamber A. The top of the hood is formed by a perforated plate K, both plate and hood being composed of some highly-refractory material.

Over the top of the hood is a sliding plate

M, containing openings N, which register with the openings L in the top of the hood. If the plate M be shifted by a rod I, the openings in the top of the hood will be varied in area so as to close or open to any desired extent the draft through the hood.

The operation or effect of this device will be readily understood. When the gas-jets have been ignited, the volume of incandescent gas projected up into the hood is too great to find vent through the perforated top, and hence a portion of it will pour out around the lower edges of the hood, thus enveloping, to an extent determined by adjustment, the upper portion of the generator, raising the latter to a high temperature. The heat not absorbed in this work passes upward in the space between the walls of the chamber A and hood B.

Having now described my invention, what I claim as new is—

1. The combination with a gas-generator having a steam-chamber and a fuel-chamber in which the fuel and steam are mixed, and from which they issue through nozzles or burners opening from the said chamber, of a hood placed in front of the burners and into which the ignited gases are projected, and by which such gases are deflected backward upon the generator, as set forth.

2. The combination with a hydrocarbon-gas generator having a steam-chamber and a gas-chamber in which the gas and steam are mixed, and from which they issue through nozzles or burners in the wall of said chamber, of a hood placed in front of the burners and into which the ignited gases are projected, and by which such gases are deflected backward upon the generator, the hood having a perforated end or top, as set forth.

3. The combination with a hydrocarbon-gas generator with nozzles or burners thereon, of a hood supported in front of the burners so as to deflect the ignited gases issuing from the burners backward upon the generator, the hood and generator being adjustable with respect to each other, whereby the distance of the generator from the opening of the hood may be varied, as set forth.

4. The combination with a hydrocarbon-gas generator with nozzles or burners thereon, of a hood supported in front of the burners for deflecting the ignited gases issuing therefrom backward upon the generator, the top or end of the said hood being provided with passages or perforations, and a slide or damper for varying the apertures of said passages, whereby more or less of the ignited gases may be permitted to pass through the hood, as set forth.

5. The combination of a combustion-chamber or fire-box, a gas-generator having nozzles or burners thereon located within said combustion-chamber, a hood also within said chamber supported in front of the burners and adapted to deflect a portion of the ignited gases issuing therefrom back upon the generator into passages between the walls of the combustion-chamber and the hood, as set forth.

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