G. MOONEY.

Gas-Heater.

No. 168,764.

Patented Oct. 11, 1875.

Fig. 1.

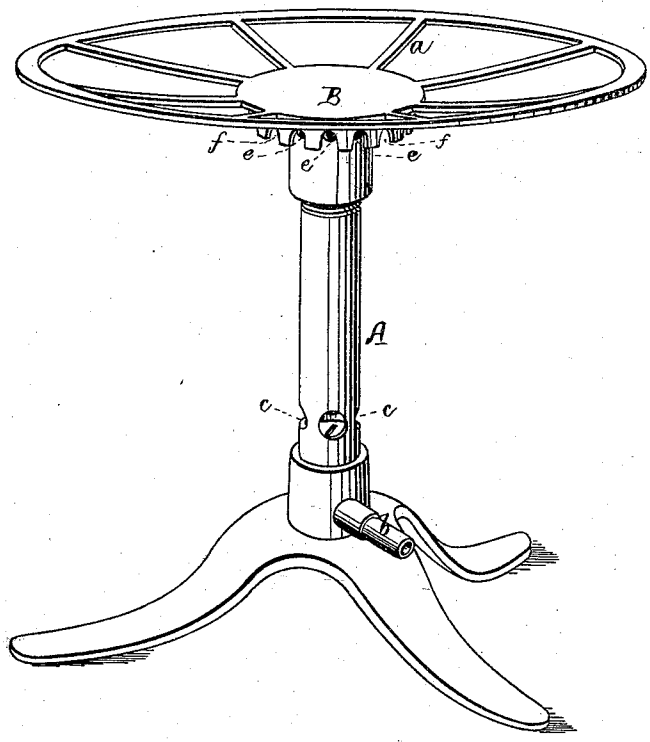

Fig. 2.

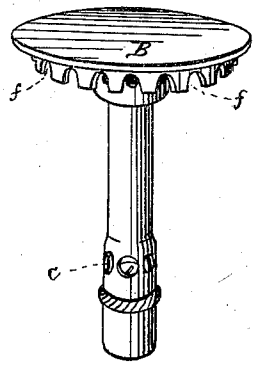

Fig. 3.

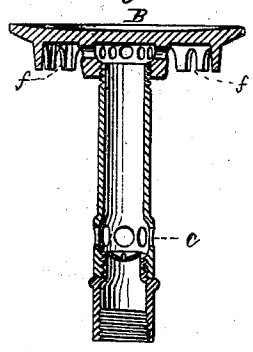

Fig. 4.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE MOONEY, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO PROVIDENCE GAS-BURNER COMPANY, OF SAME PLACE.

IMPROVEMENT IN GAS-HEATERS.

Specification forming part of Letters Patent No. **168,764**, dated October 11, 1875; application filed September 16, 1875.

To all whom it may concern:

Be it known that I, GEORGE MOONEY, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Gas-Heaters; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description thereof.

My said improvements may be embodied either in that class of apparatus known as gas-stoves, or in what may be termed as "gas-burner heaters," because of their ready applicability to common gas-fixtures.

It is well known that one of the prime objections heretofore existing to the use of such devices is the giving off of smoke and offensive odors. Especially is this true when used with gas imperfectly purified, as is too often the case. It is also well known that, whether the gas be pure or not, the smoke or odors incident to its use with heaters is the result of an imperfect combustion, and therefore much attention has heretofore been given by persons skilled in the art to devising means whereby a more complete combustion may be attained.

Realizing the importance of a thorough admixture of atmospheric air with the gas before combustion, much attention has been given to the production and combination of devices with a view to accomplishing that object; but, so far as I have knowledge, the objectionable results have not, prior to my invention, been practically obviated. All modern heaters of this class have embodied a vertical atmospheric chamber, with apertures at its base, and adjacent to the apertures a gas-jet, which delivers a circular column of gas. In some instances the atmospheric chamber has heretofore terminated at its top with a circular enlargement, having a series of delivery-apertures piercing its circumference. The circular column of gas rising in the center of the chamber maintains its individuality as it rises, and therefore resists to a considerable degree that admixture with the air which is requisite for a perfect combustion. On striking against the under side of the top of the chamber it still maintains its individuality, as it changes its course in all directions, and in its passage through the holes to combustion it is, therefore, in a measure imperfectly fitted therefor.

One feature of my invention consists in the combination, with the atmospheric chamber, of a gas-tip provided with one or more rectangular slots, and which is located within and connected to the chamber adjacent to the air-holes, and discharges the gas in a thin, flattened, or attenuated column, which is readily commingled with the air.

Another feature of my invention consists in the combination, with a gas-delivery tip of any construction and an atmospheric chamber, which delivers the gas from its top in radial jets, of a flame-controlling plate, which divides and breaks the solid sheet of flame into numerous divisions, and by such division it contributes appreciably to the perfect combustion of the gas, the consequent obviation of smoke and odor, and gives it great heating capacity.

To more particularly describe my invention I will refer to the accompanying drawings, in which Figure 1 represents in perspective a standard gas-stove embodying my improvements. Fig. 2 represents in perspective my improvements embodied in a gas-burner heater adapted to use on ordinary gas-fixtures. Fig. 3 represents the heater shown in Fig. 2 in vertical section. Figs. 4, 5, and 6 represent the gas-tip detached.

In Fig. 1, A denotes the standard, provided with suitable legs and a skeletonized plate, *a*, for receiving and sustaining a vessel. The gas enters at pipe *b*, and is discharged upward from a point adjacent to the apertures *c* in the hollow standard, which, in this instance, constitutes the atmospheric chamber.

In Fig. 4 I show the gas-burner, which is provided with a rectangular delivery-slot at *d*. This slot delivers the gas in a thin sheet, which readily loses its form as it rises, and therefore the gas freely mixes with the air entering the apertures *c*. As it rises thus mixed it strikes the interior surface of the atmospheric chamber, and is radially discharged outward through the apertures *e* to combustion. Aside from the tip, which delivers the gas in a thin, flat,

or laterally-attenuated column, the apparatus thus far described does not materially differ from others heretofore in use. The employment of the slotted tip, however, in this connection, adds greatly to the value of the heater, not only in relation to the appreciable absence of smoke and odor, but also in relation to its economy in the consumption of gas and an increased heating capacity.

In Fig. 5 I show a tip in which two delivery-slots are employed, each rectangular in outline, but crossing each other at right angles. In Fig. 6 I show a tip having three short rectangular slots radiating from a common center. With each of these forms of slots the gas is delivered in attenuated columns, and thereby readily mixed with air in the chamber.

B denotes the novel flame-controlling plate. It is composed of any suitable incombustible material. It is circular in form, and in this instance constitutes a part of the top of the combustion-chamber. It may, however, be separately made, and attached thereto. This plate has a downwardly-projecting flange, which is provided with numerous apertures, as at *f*. The solid portions of the flange between these apertures arrest the solid flame, and separate or divide it into as many jets of flame as there are openings in the flange.

It will be seen that the uprising air from beneath the plate, outside of the atmospheric chamber, has abundant opportunity to mingle with these several flames during their separation and afterward, and by this means sufficient oxygen is afforded to effect a practically-perfect combustion of the gas.

In practical operation, with a heater embodying both features of my invention, no appreciable smoke or odor is given off, regardless of the character of the gas, and it is believed that a given degree of heat may be attained therewith with less gas and in a shorter time than can possibly be attained with a similar apparatus having the circular gas-column and no flame-separating plate.

The heater shown in Fig. 2 has a small atmospheric chamber, and is provided with a base which has an internal thread for attachment to a gas-fixture. Under most circumstances this form of heater will not require the skeletonized plate shown in Fig. 1, as it is intended for nursery purposes, for heating liquid in small cups.

During an extensive experience in the manufacture of gas-burners I have had occasion to employ gas-tips with rectangular slots in various connections; but I am not aware that prior to my present invention such tips have ever been employed in combination with atmospheric chambers in a gas heater or stove.

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

1. The combination, in a gas-heater, of an atmospheric chamber and a gas-tip, which is located within and connected to the chamber adjacent to the air-induction apertures, and is provided with one or more rectangular slots, substantially as described, whereby the gas is delivered into the atmospheric chamber in a thin, attenuated, flattened column, as and for the purpose set forth.

2. The combination, with a gas-jet and an atmospheric chamber, which delivers the mixed gas and air in radial jets from the top of the chamber, of a flame-separating plate having a downwardly-projected flange provided with openings, substantially as described, and for the purpose set forth.

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Witnesses:

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