(No Model.)

# J. MADDEN.

## VAPOR BURNER.

No. 260,762. Patented July 11, 1882.

Fig. 1.

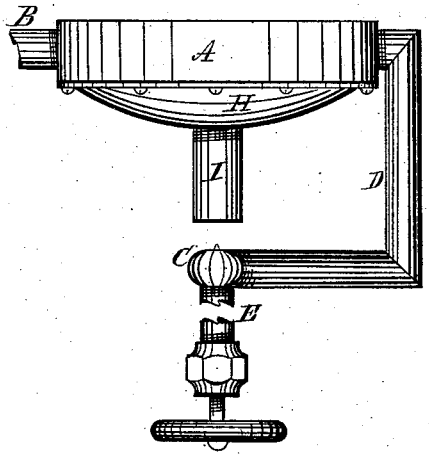



Fig. 2.

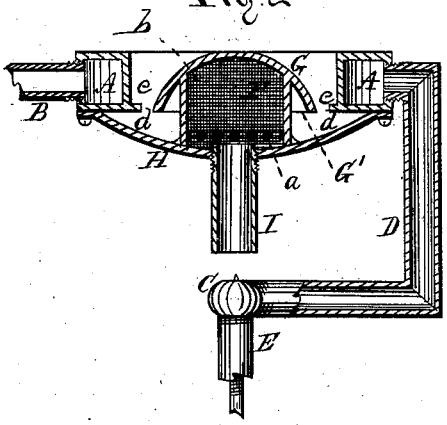
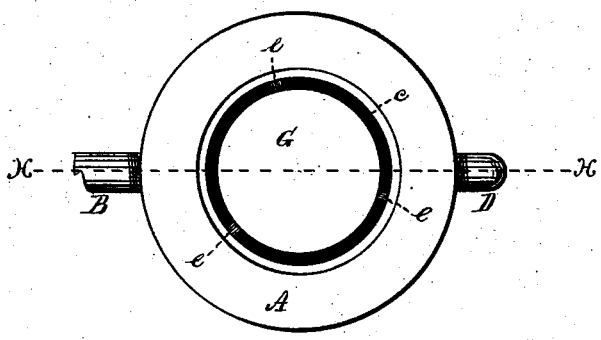



Fig. 3.




Witnesses.

J. A. Burridge

C. A. Williams

Inventor.

Jno. Madden

W. H. Burridge, Atty.

# UNITED STATES PATENT OFFICE.

JOHN MADDEN, OF CLEVELAND, OHIO.

## VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 260,762, dated July 11, 1882.

Application filed November 21, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN MADDEN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Vapor-Burner; and I do hereby declare that the following is a full, clear, and complete description thereof.

My invention relates to vapor-burners the nature of which consists of one or more annular generating-chambers surrounding a combustion-chamber of peculiar construction connected with the said chamber, an oil-induction and vapor-eduction pipes, the latter arranged in open relation with the needle-valve mechanism.

For a more full and complete description of the said invention, reference will be had to the following specification, and to the annexed drawings, making part of the same, in which—

Figure 1 is a side view of the burner; Fig. 2, a vertical central section through the line *x x* in Fig. 3. Fig. 3 is a top view.

Like letters of reference refer to like parts in the several views.

The general configuration of the burner is as seen in Figs. 1 and 2, in which A is an annular generating vapor or gas chamber, the inlet to which from the oil-reservoir is by means of the induction-pipe B. The vapor or gas generated in the chamber A is conveyed to the needle-valve C by the eduction-pipe D, the upper end of which is in open connection with the chamber A and the lower end with the needle-valve chamber or pipe E, as seen in Fig. 1.

The needle-valve mechanism is or may be the same as in ordinary use.

Within the area of the generating-chamber A is the combustion-chamber F, Fig. 2, covered over or closed by a cap, G, at the top, and provided with perforations or holes *a* at or near the base. In this chamber and covering the openings *a* are one or more cylinders or volutes of wire-gauze or perforated sheet metal, *b*, which reach from the base to the cap, or nearly so. This cap extends from the outside wall of the chamber and forms a projection or diaphragm, G′, between which and the inside wall of the generating-chamber is an annular slot-opening, *c*, Figs. 2 and 3, which opens into the passage *d* from the area of the generating-chamber A, and is formed between the projection or diaphragm G′ and the base H of the burner.

In place of the slot, a series of holes may be substituted.

The base is secured to the under side of the chamber by any suitable device. The vapor pipe or tube I is attached to the said base, and is in line with the needle-valve C and opens into the combustion-chamber F, as seen in Fig. 2.

For the purpose of retaining the chamber in position a circular shoulder is formed upon the inner surface of the base, upon which fits the lower and open end of the chamber, and to aid in this purpose there are lugs *e*, Fig. 3, which project from the edge of the diaphragm across the slot *c* to the wall of the chamber A, by which means the chamber is supported and held in position above and below. At the same time the chamber may be readily taken out and replaced as occasion may require. As the lower end of the chamber is open, it may be readily cast without a core, and easily cleaned when fouled by use, or removed from the base which forms the floor of the chamber.

The oil or gasoline for supplying the burner enters the chamber A through the pipe B, in which chamber it is converted into vapor or gas by first pouring a small quantity of the fluid into the passage *d* through the annular slot *c*, which is ignited to cause the heat therefrom to be communicated to the chamber supplied with oil, as before stated. The vapor thus generated from the fluid passes from the said chamber to the needle-valve C through the pipe D. From the needle-valve it issues into the tube I, thence into the combustion-chamber F, and then through the gauze *b* and perforations *a*, into the passage *d*. The heat developed in the combustion-chamber and the passage causes a constant generation of vapor in the chamber A so long as it is supplied with requisite fluid, and at the same time a volume of heat and flame issues through the annular slot *c*. Hence the heat from the combustion-chamber flows into the passage *d* and under the generating or vaporizing chamber, and is directly in contact with the inside walls as the heat issues through the annular slot.

In place of the chamber A, there may be arranged pipes forming coils or rings, more or less in number, the object being to present a

rapid generating and heating capacity, which is attained by the arrangement herein described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In vapor-burners, the combination, with the combustion-chamber F, having a lining of wire-gauze and perforations leading from said chamber into the passage *d*, of a pipe, I, and the annular generating-chamber A, having a pipe-connection with the oil-reservoir and needle-valve mechanism, substantially as described, and for the purpose specified.

2. In vapor-burners, an annular vaporizing-chamber provided with induction and eduction pipes, and a combustion-chamber arranged within the area of said vaporizing-chamber, in combination with the base H, having a tube connected therewith leading into said combustion-chamber, and a diaphragm attached to and extending from the outside wall thereof to an annular slot, substantially in the manner as described.

3. An improvement in vapor-burners, consisting of the perforated combustion-chamber F, with a diaphragm, G, extending to the slot or opening *c*, with a passage, *d*, between the diaphragm and base, with a tube leading into said chamber above the needle-valve, in combination with the annular chamber A and pipes B D, substantially as and for the purpose set forth.

4. In vapor-burners, the combustion-chamber provided with perforations arranged in open relation with the passage *d* between the base and diaphragm G, in combination with the slot or opening *c* within the area of the generating-chamber, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN MADDEN.

Witnesses:

W. H. BURRIDGE,

J. H. BURRIDGE.