(No Model.)

J. STUBBERS.

VAPOR BURNER.

No. 422,166. Patented Feb. 25, 1890.

Fig. 1.

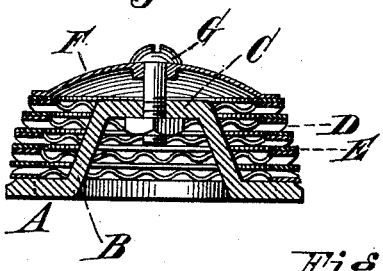


Fig. 2.

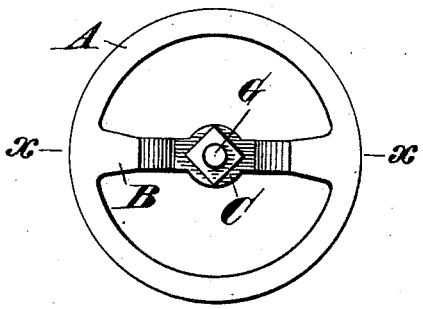


Fig. 4.

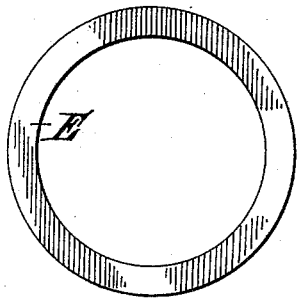
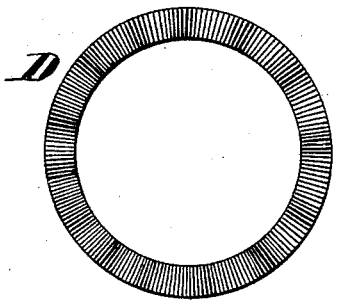


Fig. 3.



ATTEST

John Adam

J. H. Charlesmith

INVENTOR

Joseph Stubbers,

by John E. Jones,

his Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH STUBBERS, OF CINCINNATI, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 422,166, dated February 25, 1890.

Application filed November 4, 1887. Serial No. 254,273. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH STUBBERS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Vapor-Burners, of which the following is a specification.

The several features of my invention and the advantages resulting from their use conjointly or otherwise will be apparent from the following specification and claims, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a central sectional elevation on line *x x*, Fig. 2, showing my burner in its preferred form; Fig. 2, a bottom plan view of the same; Fig. 3, a plan view of one of the corrugated rings, and Fig. 4 a plan view of one of the flat rings forming the spacing-partitions in my burner.

A represents a circular skeleton frame having the transverse web or arms B, formed with an upright center or arch C.

D represents each one of a series of rings radially corrugated or fluted, as clearly shown in Fig. 3.

E represents each one of a series of flat rings or washers alternately interposed between the corrugated rings D, thereby forming spacing-partitions, whereby the corrugations or flutes in said rings D may form openings or jets for the discharge of the gases to be burned. The diameters of rings D and E may decrease toward the top of the burner, as shown in Fig. 1, to form a more symmetrical device; but it is obvious that the burner would operate quite as well if the rings were of like diameters.

F represents a cap-plate or dome fitting on top of the uppermost ring of the piled-up series. Plates D and E are alternately arranged one upon the other, as hereinbefore stated, in horizontal array upon the rim of frame A, as shown in Fig. 1.

G is a screw-bolt inserted through cap F and the arched center C of the frame, receiving a nut on its lower end to properly bind the parts together.

The rings D and E preferably fit snugly over the arched center C to readily set them in place in putting the parts of the burner together, and thereby prevent their shifting. In Fig. 1, however, I show the arched center as of lesser diameter than the openings in the rings, so as to bring out the parts of the burner more clearly.

My burner in use is fitted upon the well-known Bunsen burner or other similar device in any suitable and desirable manner, and the gas passes freely through the openings formed by the combination of the alternating fluted and plain rings without fear of clogging, and with a plentiful supply of air to support combustion at the usual point on the periphery of the burner.

The advantages of having the plates, as D, corrugated enables me to obtain more openings for gas with less material, and also to obtain more openings in the same space.

A good burner should be one that will operate equally well when a small supply of gas is being admitted and the flame is burning low as when a large supply of gas is being admitted and the flame is burning high. When the flame is burning low, if the openings are large, the flame will go inside of the burner instead of coming outside. When it goes inside, it sometimes explodes and often goes out immediately. In my burner the openings are small and numerous. The metal, being corrugated, will not warp, as is the case with the cast-iron rings channeled on one side only now in use.

A very desirable material to be employed is sheet metal, because it enables me to form the corrugations very small, very frequent, and very exact. Further, such corrugated sheet metal will not break, even if water or other liquid be spilled on the burner. The corrugations in the plate stiffen it, which is another advantage of my invention.

Of course the corrugated plates D could be brought into immediate juxtaposition and come within the broad feature of my invention; but such an arrangement is somewhat more expensive, as in case I dispensed with the flat plates E, I should be obliged to hold the adjacent plates D in place with reference to each other by means of some suitable device for keeping the openings in adjacent plates in proper relation to each other.

Where the flat plates E are employed, the opening of one plate D need not be adjusted

with reference to the opening of another plate D; nor is it necessary to have a device to hold the plates D in position in reference to their respective openings.

While the various features of my invention are preferably employed together, one or more of them may be used without the remainder, and one or more of them may be employed in connection with burners other than the one herein set forth.

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

1. In a vapor-burner, a series of annular corrugated plates or rings D and annular flat rings or plates E, the latter lying alternately between the former, the rings or plates forming and inclosing a gas-chamber, substantially as and for the purposes specified.

2. In a vapor-burner, a series of annular corrugated plates or rings D and annular flat rings or plates E, the latter lying alternately between the former, the rings or plates forming and inclosing a gas-chamber, the plane of the plates or rings being at right angles to the axis of the chamber, substantially as and for the purposes specified.

3. In a vapor-burner, a gas-chamber formed by a surrounding wall of annular plates or rings D and E, and a cap or cover F, the plates or rings being corrugated and alternating with the flat rings E, the gas-inlet to said chamber being at the opposite end of the chamber from where the cap is located, substantially as and for the purposes specified.

4. In a vapor-burner, a series of annular corrugated plates or rings D and annular flat rings or plates E, the latter lying alternately between the former, the rings or plates forming and inclosing a gas-chamber, the plane of the plates or rings being at right angles to the axis of the chamber, the corrugations forming the means of communication between the inclosed chamber and the exterior of the burner, these corrugations, respectively, increasing in size as they approach the exterior of the burner, substantially as and for the purposes specified.

5. In a vapor-burner, the combination of a series of corrugated rings or plates D, flat rings or plates E, the latter lying alternately between the former, and the skeleton frame A, having transverse web or arms B and formed with an upright center or arch C, and cap F and screw-bolt securing the cap to the arch C, substantially as and for the purposes specified.

In testimony of which invention I have hereunto set my hand.

JOSEPH STUBBERS.

Witnesses:
JOHN E. JONES,
JOHN ADAM.