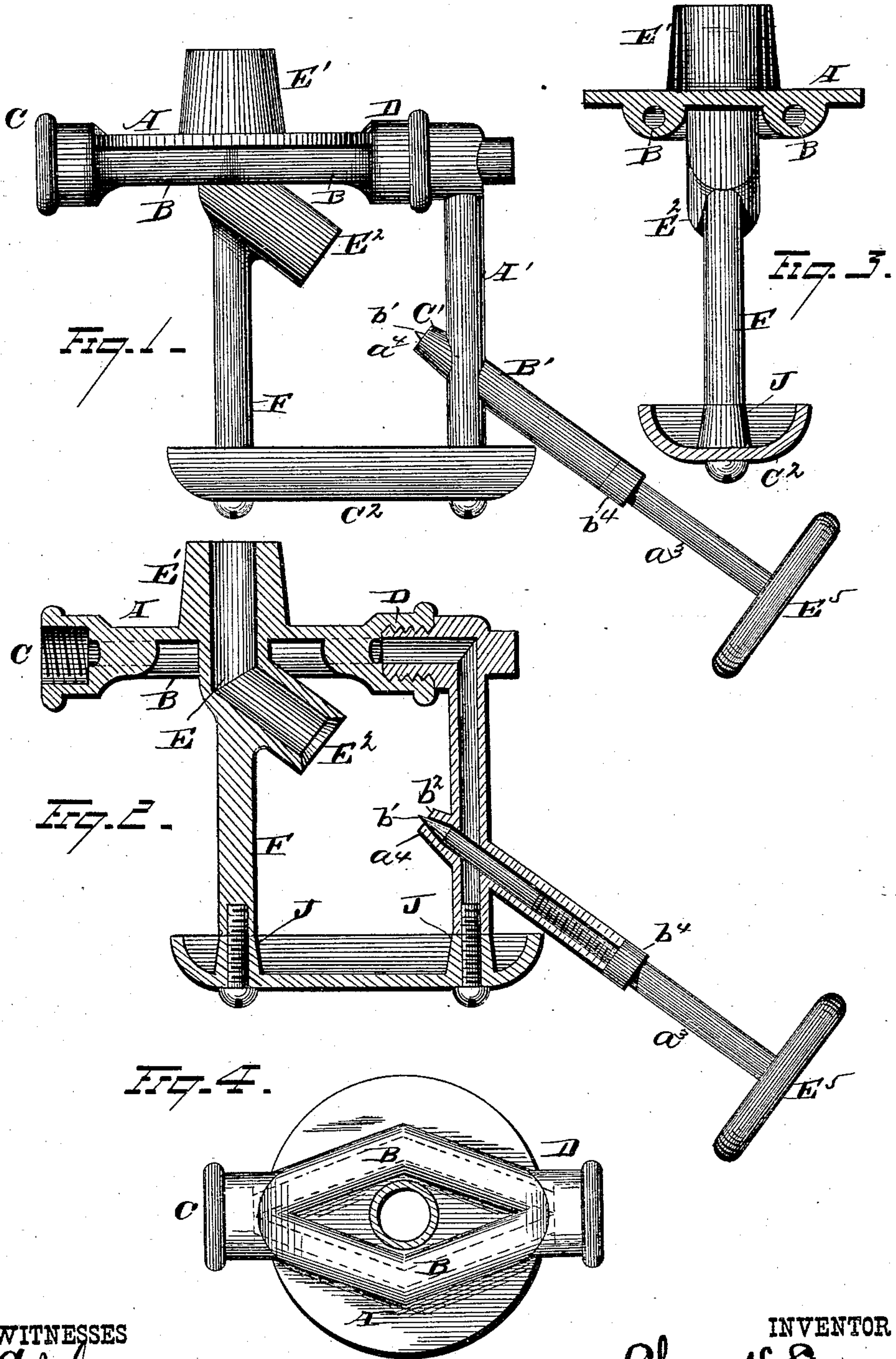


(Model.)

C. H. GOVE.  
VAPOR BURNER.

No. 245,711.

Patented Aug. 16, 1881.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

CHARLES H. GOVE, OF NORWALK, OHIO.

## VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 245,711, dated August 16, 1881.

Application filed November 29, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. GOVE, of Norwalk, in the county of Huron and State of Ohio, have invented certain new and useful  
5 Improvements in Vapor-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being  
10 had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in vapor-burners, the object being to provide a device of this character of simple construction and operation, adapted to generate the vapor to support its own flame without the diversion of a part thereof, and without the employment of a secondary flame, and rendered safe against explosions by new devices  
15 taking the place of the vapor-storing chambers heretofore employed in most vapor-burners.

With these objects in view my invention consists in certain details of construction, as will hereinafter be described, and pointed out  
25 in the claim.

In the accompanying drawings, Figure 1 is a view, in front elevation, of a vapor-burner constructed in accordance with my invention. Fig. 2 is a view in vertical section. Fig. 3 is  
30 a view in vertical cross-section; and Fig. 4 is a plan view of the under side of the burner-plate of my improvement.

Let A represent a burner-plate having a bifurcated oil-conduit, B, reservoir and valve-connections C and D, mixing-chamber E and depending foot F, cast in same piece therewith. The burner-plate A is of circular form and has a bifurcated oil-conduit, B, through which the oil passes, and in which the vapor  
40 is generated, cast on its lower face. This conduit is provided at each end and at opposite points on the burner-plate with connections C and D, by means of which connection is made respectively with the oil-reservoir, placed  
45 at any point conveniently remote, and the depending pipe A', through which latter the oil and gas passes to the valve-sleeve B'. By providing two passages or conduits for the oil it is presented to a greater surface of the heated  
50 burner-plate, thereby insuring the sufficiently-rapid generation of gas to supply the flame.

The upper arm, E', of the mixing-chamber E is located centrally of the burner-plate, is at right angles therewith, and is adapted to be fitted with any form of gas or vapor burner. 55 Any devices resorted to for the actual combustion of the gas, as long as they are located on the burner-plate, will transmit enough heat to it to vaporize the oil filling the two conduits thereunder. 60

That end, E<sup>2</sup>, of the mixing-chamber which projects from the lower face of the burner-plate and is located between the two arms of the bifurcated conduit forms an acute angle with the burner-plate, and is turned to the right to receive the stream of oil or gas, as the case may be, that is projected from the valve device, to be hereinafter described. 65

The outer face of the end E<sup>2</sup> of the mixing-chamber is provided with a depending foot, F, 70 made integral therewith or attached thereto, said foot being counterbored at its lower end to receive a screw, by means of which the drip-cup C<sup>2</sup> is attached to the foot. The drip-cup, having its outer end attached, as described, 75 to the foot F of the mixing-chamber, has its rear end attached to the lower end of depending pipe A', which is counterbored like foot F.

It will be observed that the basin of the cup is provided with two upright studs, J, as high 80 as the top of the cup, each of said studs being vertically perforated to receive screws which are inserted from the lower face of the cup and pass up through into the counter-bores in the depending foot F and the pipe A'. The advantage of this construction of cup renders leakage of the cup impossible and does away with that obnoxious feature of vapor-burning. 85

Connection D, at the rear end of the burner-plate, is internally screw-threaded, and adapted 90 to receive in tight connection the upper end of the depending pipe A', which provides open communication between the oil-conduits and the valve-sleeve, through the upper end of which latter the oil or vapor is projected into 95 the lower end of the mixing-chamber E<sup>2</sup>. The said valve-sleeve B' crosses the depending pipe A' in such position that it is bisected by a plane bisecting the lower end of the mixing-chamber. That end of the said valve-sleeve 100 which projects over the rear edge of the drip-cup is internally screw-threaded and adapted



to receive the valve-stem  $a^3$ . It is by means of this screw-thread adjustment that the size of escape-aperture  $a^4$  is varied and controlled. The upper end of the valve-sleeve, having the form of the frustum of a cone, is centrally perforated at  $a^4$ .

The pointed end  $b'$  of the valve-stem  $a^3$  plays in the valve-seat  $b^2$ , and thus regulates the escape of vapor or oil, as the case may be, the manipulation of the valve within the valve-seat being accomplished by the hand-wheel  $E^5$  at the extreme lower end of the valve-stem. The valve-stem  $a^3$  is further provided with a device to prevent injury to the valve-seat  $b^2$ , said device consisting in a band,  $b^4$ , located at such a point on the valve-stem  $a^3$  that when the valve is perfectly closed the band will impinge against the lower end of the valve-sleeve  $B'$  and prevent any injury to or enlargement of the valve-seat.

Having thus described the detailed construction of my improved vapor-burner, I will now briefly describe its method of operation.

Let us first suppose the perforation  $a^4$  to be closed and the bifurcated conduit, the depending pipe, and the valve-sleeve to be filled with oil. It is first necessary to generate sufficient heat to raise the burner-plate to a temperature high enough to vaporize the oil contained in the bifurcated conduits forming a part thereof. This is accomplished by reversing the hand-wheel at the end of the valve-stem, thereby opening the valve and allowing a fine stream of oil to be projected into the mixing-chamber. Said oil will now of its own gravity fall into the drip-cup, where it is ignited.

The great advantage obtained by changing the direction of the oil-current in first throwing it into the mixing-chamber, from which it drips by its own gravity into the drip-cup, is that no oil comes in contact with the exterior of the valve sleeve or stem, which will be perfectly clean, and will not soil the hand—an objection urged against many of this class of burners.

The oil in the drip-cup, as has been said, is ignited, and it will heat the burning-plate, which will, in turn, heat and vaporize the oil contained in the bifurcated conduits forming a part thereof. When, now, the valve is reopened, it having been closed during the burning of the oil in the drip-cup, a fine stream of gas will be projected from the aperture  $a^4$  into the lower end of the mixing-chamber, mingling with air in its passage thereto, and finally issue at the upper end of the mixing-chamber, where it may be burned in any approved form of burner suited to the use for which the flame is designed. After the flame is once started it will transmit enough heat to the burner-plate, being in close proximity thereto, to vaporize the oil contained in the bifurcated conduit, and thus supply the vapor necessary to support its own life. It will thus be seen that the bifurcated conduit, the depending pipe, and the valve-sleeve perform the twofold func-

tion of offering a duct for the passage of oil in the first instance, and of providing a vapor-chamber in the second.

A separate chamber for the generation of vapor is unnecessary, and the danger of explosion from the too rapid generation and consequent confinement of vapor in a vapor-chamber is avoided.

The amount of vapor passed to the flame may be easily regulated by the needle-valve, and in the event of accumulation of a greater amount of vapor than could be accommodated in the conduits provided therefor, the only effect of such accumulation would be to drive a portion of oil in the reservoir-tube back toward the reservoir.

Among the advantages of my burner two of importance might be enumerated. The first of these is the ease of its regulation and operation, owing to the convenient position of the regulating-valve; and, second, the steadiness of the burning flame, owing to the arrangement of and the manner of generating and using the vapor. Burners provided with a chamber for storing vapor almost invariably flare, owing to the variations in pressure, and also make a disagreeable puffing noise, due to the pressure of the confined vapor; but in my burner these objections are surmounted by the devices hereinbefore described.

I would have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such slight changes and alterations as fall within the spirit and scope of my invention.

I am aware that the burner-plate of a vapor-burner has had oil-conduits formed therein in casting, and hence I make no broad claim to such construction.

In my improved construction the oil-conduits depend from the under side of the burner-plate, so that the heat radiated from the latter will be transmitted to the oil in the conduits by the comparatively thin walls constituting the lower portion of the conduits.

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

In a vapor-burner, two oil-conduits cast on its under face, said conduits intersecting each other at opposite points on the burner-plate, and provided at such points of intersection with pipe-connections, and having an angled mixing-chamber located between the two conduits, and extending above and below the burner-plate, the lower arm of said chamber being provided with a depending foot to support a drip-cup, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of November, 1880.

CHARLES H. GOVE.

Witnesses:

O. E. KELLOGG,  
T. R. STRONG.