

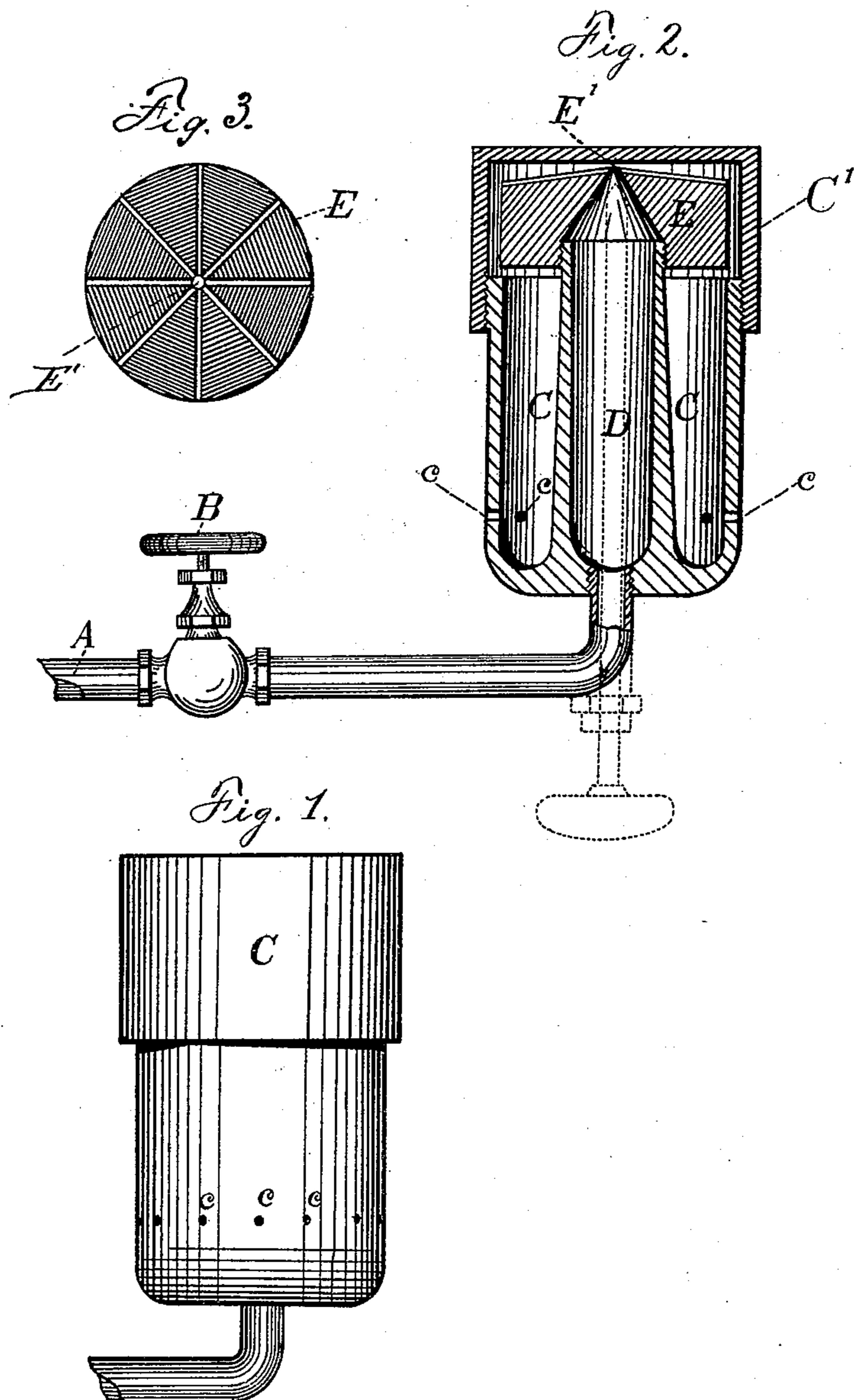
(No Model.)

J. F. CHURCH.

VAPOR BURNER.

No. 253,003.

Patented Jan. 31, 1882.



WITNESSES

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JOHN FRANK CHURCH, OF ALBION, MICHIGAN.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 253,003, dated January 31, 1882.

Application filed September 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, J. FRANK CHURCH, of Albion, county of Calhoun, State of Michigan, have invented a new and useful Improvement in Vapor-Burners; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention consists in the combinations of devices and appliances hereinafter set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 is an elevation of a vapor-burner embodying my invention. Fig. 2 is a vertical central section of my device. Fig. 3 is a top view of the distributing cap or plate.

It is the object of my invention to make a burner which shall be more particularly adapted for lighting purposes and capable of producing a much larger and more brilliant flame than heretofore.

To this end A is a pipe leading from the reservoir. B is a hand-valve, by which the flow of hydrocarbon and consequently the size of the flame is regulated. C is a chamber, and D an inner central chamber communicating with the pipe A. E is a distributing-cap located at the top of the inner chamber, D, which is diminished at this point, so as to furnish a small orifice for the discharge of the hydrocarbon into the chamber C. This distributing cap or plate consists of a thick metal disk having in its under side a central recess, the inner portion of which is conical and has a small opening through from its apex to the top of the plate. Below the base of the conical portion the recess is cylindrical and screw-threaded, in order that the cap may be screwed upon the top of the correspondingly-threaded tube D. The distributing-cap is preferably grooved radially upon its upper surface, so as to distribute the fluid uniformly upon all sides so long as it is flowing.

The device is shown without a needle-valve, though one is represented in dotted lines, which may be employed, if desired, to increase or diminish the size of the orifice E'. I prefer generally not to employ it, though it may be used;

but the hand-valve B is generally ample to regulate the flame. A cap, C', is preferably screwed upon the upper end of the chamber C in close proximity to the jet E'. It facilitates the cleaning of the chambers in case they become deranged by sediment or scale, &c. c c are the burning-jets. The length of the chambers may be greater or less, as desired, dependent on the light required being greater or less.

The operation of the device is as follows: Hydrocarbon entering the chambers through the valve B soon emerges from the burning-jets c, where it is lighted. The heat upon the surface of the chamber C soon converts the liquid within it to the form of vapor, which issues from and is burned at the jets c. As the heat becomes more intense the inner chamber, D, becomes likewise heated, so that the liquid within it is likewise vaporized, and issues from it through the jet E' into the outer chamber, C, which now serves the part of a superheater, which serves more or less to convert the vapor into a fixed gas. When thus in full operation the size of the flame can be regulated by the quantity of hydrocarbon admitted through the valve B.

It is well known that many vapor-burners burn with pulsating action, due to the fact that the sudden expansion of the liquid into vapor reacts upon the liquid and starts it back into the reservoir. It then again advances, furnishes another fresh supply of liquid to the hot parts, and the vapor generated again forces it back, thus creating regular pulsations which are very disagreeable. My device overcomes this difficulty, because the inner chamber, D, not being liable to sudden changes in its temperature, does not of itself give rise to these pulsations. In the outer chamber, C, however, any sudden change has to act through the diminished orifice E', and then upon the contents of the inner chamber, D, before it can exert its energy upon the liquid. It is then so far expended that it can have but little effect in forcing the liquid back. If it does so act in a slight degree, the liquid on its return has in like manner to exert its impulse first upon the vapor in the chamber D, and then through the orifice E' and the vapor in the outer chamber,

C, before it can affect the flame. In practice these pulsations are thus effectually overcome.

I have found this burner to yield a very large and brilliant flame, and it possesses the advantages of being exceedingly simple and very easy to operate. The jet of vapor at E' impinges directly against the cap-plate, so as to break it up and distribute the vapor more uniformly throughout the chamber C. Therefore
10 What I claim is—

1. A vapor-burner consisting of a hollow crown perforated with burning-jets, an inner central tube, one end of which is connected with the liquid-conduit, the other provided with

a diminished orifice leading into the hollow 15 crown, and a distributing-plate provided with a central aperture and fixed upon the top of said central tube, substantially as described.

2. The combination, with the outer chamber, C, inner chamber, D, and the distributing- 20 plate E, having the central orifice, of the removable cap C', substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN FRANK CHURCH.

Witnesses:

JOEL LABERTEAUX,
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