

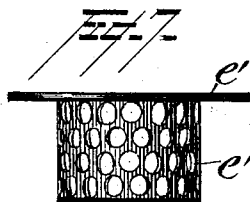
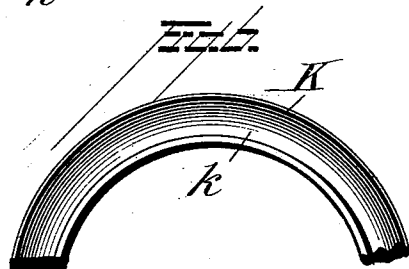
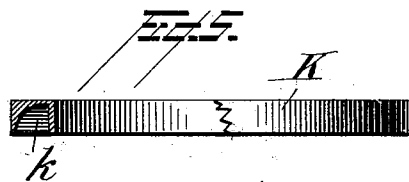
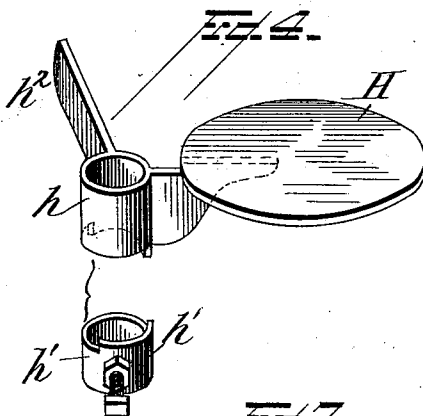
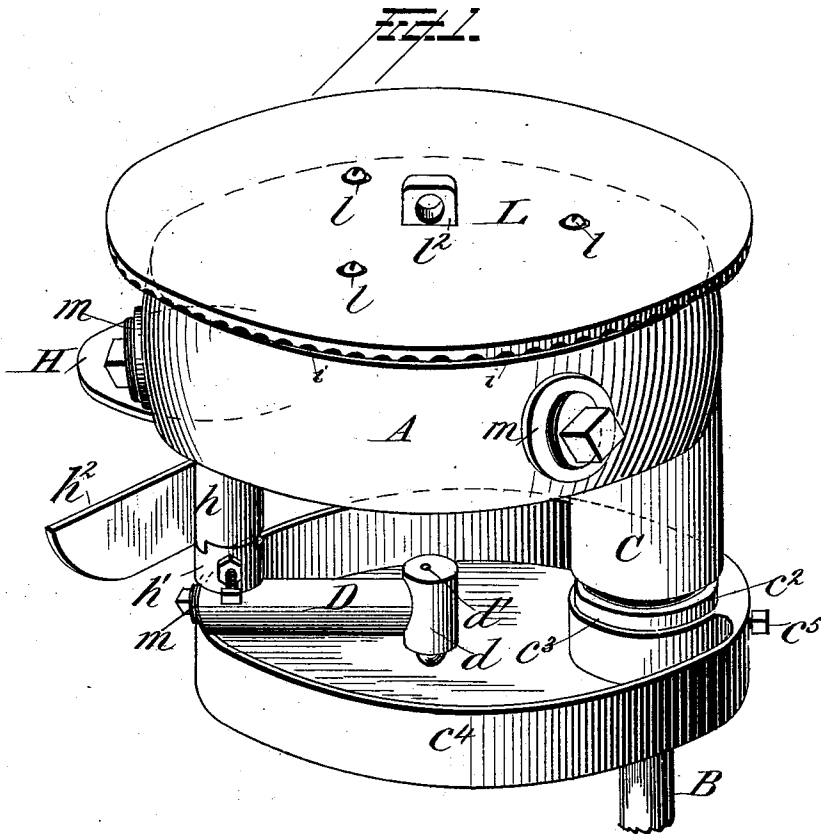
(No Model.)

2 Sheets—Sheet 1.

S. E. FOLK.
VAPOR BURNER.

No. 513,909.

Patented Jan. 30, 1894.



Attest:
H. H. Schott
Alfred T. Sage

Inventor
Samuel E. Folk,
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Attorney.

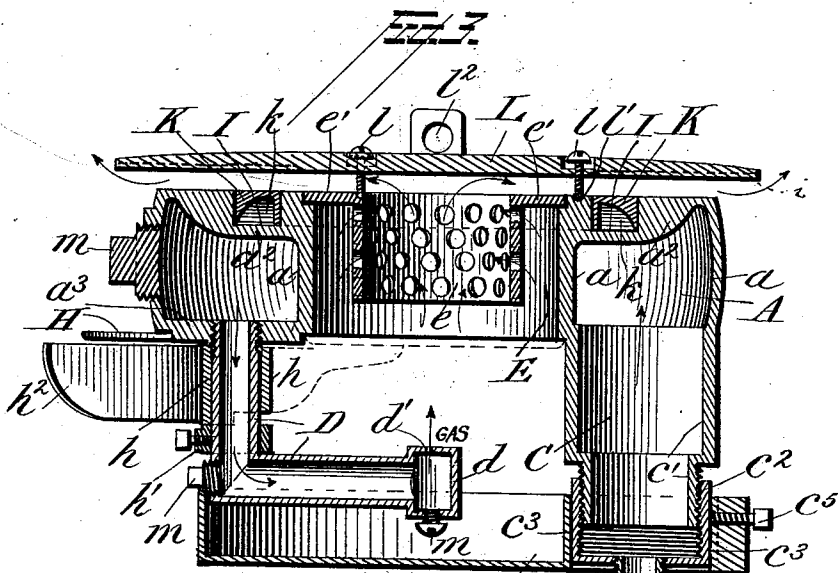
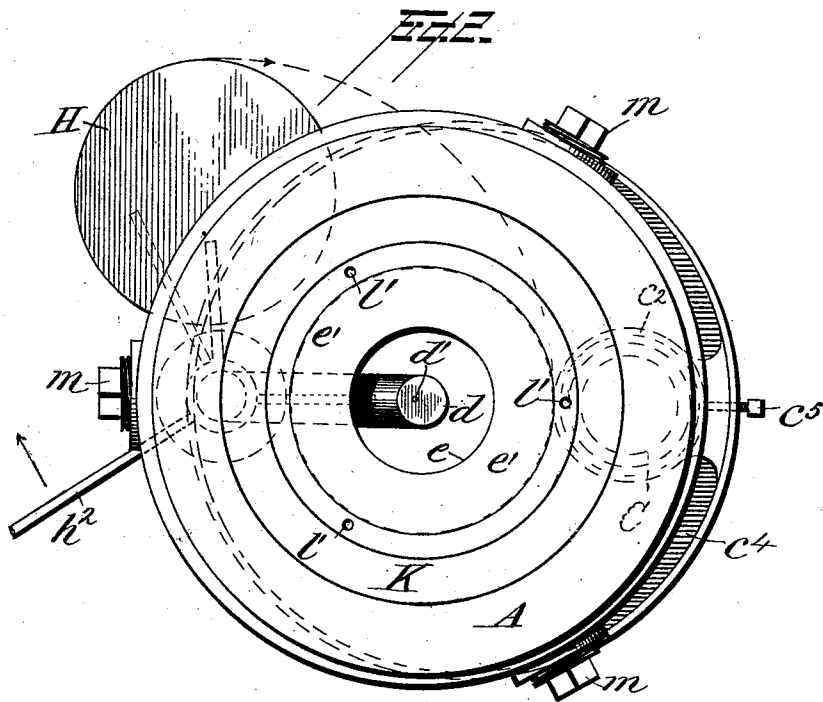
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2 Sheets—Sheet 2.

S. E. FOLK.
VAPOR BURNER.

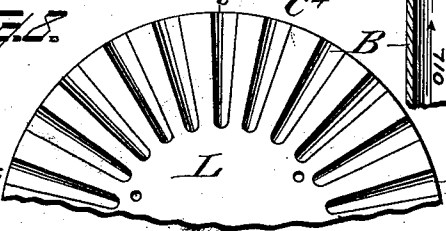
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UNITED STATES PATENT OFFICE.

SAMUEL E. FOLK, OF BRYAN, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 513,909, dated January 30, 1894.

Application filed January 5, 1893. Serial No. 457,321. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. FOLK, a citizen of the United States, residing at Bryan, in the county of Williams and State of Ohio, have invented certain new and useful Improvements in Vapor-Burners; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in vapor-burners of that class in which oil is fed from a reservoir to a heated chamber wherein it is vaporized and fed therefrom to the place of ignition, first, however, passing through a mixer whereby it is mixed with air.

The invention has for its object the construction of such a device, whereby the oil is relieved of any sediment before it enters the vaporizing chamber and other parts to clog the same; in which the heat applied to the vaporizing chamber can be regulated, as too much heat will produce a gas too thin to obtain the maximum temperature at the burner proper; whereby the gas after leaving the vaporizing chamber and before reaching the place of ignition can be thoroughly mixed with air; in which the products of combustion from ignited oil held in a suitable receptacle can be deflected around the vaporizing chamber to start the operation and also in which the supply of gas to the mixer and burner proper can be cut off to extinguish the flame, and also whereby the flame can be concentrated for cooking purposes, or spread over a comparatively large surface for heating purposes.

The invention consists in placing intermediate of the vaporizing chamber and the oil supply pipe leading thereto, a sediment depositing chamber in which the oil is vaporized to such an extent that the sediment ordinarily held in suspension will be deposited in a suitable receptacle; in forming in the top wall of the vaporizing chamber a groove and seating in the same a plate so that the solidity of the wall to a certain extent will be broken and the wall beyond the break be less liable to overheating as the break in the wall lessens

its conductivity to a great extent, and thereby insures the gas against becoming too thin; of a mixer whereby the gas can be thoroughly mixed with air before reaching the place of ignition; of a cut off adapted to be interposed between the gas supply pipe leading from the vaporizing chamber and the burner, proper, to put out the flame and also to deflect the products of combustion of the oil lighted in a suitable receptacle around the vaporizing chamber to generate gas on first putting the device into operation, and of a deflector adapted to be placed over the flames to spread them over a larger surface, comparatively, to better adapt the device to heating purposes.

The invention further consists in the novel construction, combination and arrangement of parts which will be hereinafter more fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a perspective view of a vapor burner embodying the invention. Fig. 2 is a plan view of the same. Fig. 3 is a transverse vertical section. Fig. 4 is a detail perspective view showing the cut-off and the collar for adjusting the same. Fig. 5 is a detail view showing a side elevation of the annular band seated in the groove formed in the top of the vaporizing chamber, a portion being cut away to show the groove formed in its upper side. Fig. 6 is a detail view showing the grooved face of the same. Fig. 7 is a detail view showing a side elevation of the mixer, and Fig. 8 is a detail bottom plan of the deflector.

The burner is adapted to be supported in a suitable frame work, but as the latter forms no part of the invention, it is not shown or described.

Referring to the drawings by letter, A designates the vaporizing chamber into which the oil is introduced and volatilized and from which the gas so formed is conducted to the place of ignition. This chamber is inclosed by the concentric side walls a and a^2 , and the top and bottom walls a^3 and a^4 , respectively.

B designates the oil supply pipe leading from a reservoir suitably placed. Intermediate of the supply pipe and the vaporizing chamber the sediment depositing cup c is in-

terposed. It is connected by the oil conducting pipe C, preferably formed with the reduced end c' , with the vaporizing chamber. The walls of the vaporizing chamber and the conducting pipe C are made integral so that heat will be readily conducted from the vaporizing chamber to the pipe C, which would not be so readily done if they were made of several pieces joined together, as the breaks in the metal would lessen to a great extent their conductivity. In the conducting pipe C the oil is volatilized to such an extent that the impurities or sediment ordinarily held in suspension will be precipitated into the sediment cup c^2 attached to the lower reduced end c' of the pipe and connected with the supply pipe B. This cup may be removably attached, as it is shown in the present instance, so that it can be detached and cleaned. It is seated in a socket c^3 formed in the pan c^4 and is secured therein by the set screw c^5 .

From the bottom of the vaporizing chamber, on the side opposite to that with which the depositing chamber is connected, the gas supply pipe D leads to a point immediately below the circular space inclosed by the inner wall of the vaporizing chamber where it ends in an enlarged section d , which is provided with an orifice d' through which the gas escapes to the mixer. The annular space inclosed by the inner wall of the vaporizing chamber forms the chamber E in which the gas which has escaped from the orifice d' is mixed with air. Within this chamber the mixer is seated. The latter consists of a perforated cylindrical portion e provided with an annular flange e' projecting from its upper end. The outer edge of this flange is seated in a recess formed in the upper end of the wall of the chamber. The dimensions of this mixer are such that there will be quite a space between its cylindrical portion and the inner walls of the vaporizing chamber, the flange e' forming a covering for the said annular space, and so that its bottom will be some little distance above the lower end of the mixing chamber. The gas escaping from the orifice d' enters the lower end of the cylindrical portion e and passes up through the same striking against the under surface of the deflector and from there spreading out between the under surface of the deflector and the upper surface of the generator; and the current of air which passes upward between the cylinder and the wall of the mixing chamber, which current is created by the gas burning above, will also pass through the perforations in the cylindrical portion of the mixer and thus mingle with the gas. In this way a perfect mixture of the gas with the air is obtained before it reaches the place of ignition, namely the upper opening of the mixer.

H designates the cut-off, the purpose of which is to stop the flow of gas from the orifice d' to the mixer. It consists of the circular plate provided with the bearing h journaled on the vertical portion of the supply

pipe D, being held thereon in its proper position by the collar h' , the adjacent edges of the collar and bearing being recessed as shown to limit the movement of the cut-off. A lever h^2 is provided by means of which the plate can be easily moved.

The pan c^4 is secured beneath the several operative parts of the device and serves as a receptacle for any oil, &c., that may escape. It also serves as an aid in starting the fire in a manner hereinafter described.

In order to obtain the greatest amount of heat, the vaporizing chamber should not be heated to approximately the same temperature as the walls exposed directly to the flame. If the walls leading from those exposed directly to the flame were solid, that is all of one piece of metal, the vaporizing chamber would be overheated and in consequence a poorer quality of gas supplied. In order to avoid this, an annular groove I is formed in the top wall of the vaporizing chamber in which the annular plate K is seated. In this way a break in the wall is formed which will to a great extent lessen its conductivity. To further secure this object the under side of the annular plate is grooved at k . In this way the temperature of the vaporizing chamber will be much lower than that of the flame.

A deflector L is supported above the burner by the adjustable screws l . Its object is to spread the flame over as much surface as possible, which better adapts the device for heating purposes. The under surface of this deflector is formed with a series of corrugations i radiating toward the periphery of the deflector so as to form a series of channels through which the gas will pass in small streams or jets to the point of ignition or combustion at the periphery of the deflector whereby the burning and heating capacity of the burner is increased. The proper height at which this deflector should be placed cannot, generally, be predetermined, and consequently, each deflector should be provided with means whereby its proper adjustment with its own particular burner can be secured. The screws l serve the purpose. They can be turned so that the plate will be supported at a greater or lesser height as the case may be.

The top wall of the vaporizing chamber is provided with sockets l' for the reception of the lower ends of the screws.

When it is desired to use the burner for cooking purposes, the plate can be set aside by means of the perforated lug l^2 .

The screws and plugs m serve no other purpose than to close the openings made to allow the removal of the cover of the casting and a proper cleaning of the same.

The operation of the device is as follows: The valve in the supply pipe leading from the oil reservoir is opened and the sediment depositing chamber, the vaporizing chamber partly and the gas supply are filled with oil until some of it escapes from the orifice d'

into the pan. The oil in the pan is lighted and in order that it will more quickly heat the vaporizing chamber, and convert the oil contained therein into gas, the cut off is turned to close the opening in the bottom part of the mixing chamber so that the products of combustion will pass around the vaporizing chamber instead of through the mixing chamber. When the orifice *d'* commences to emit gas, the cut-off is opened and the gas allowed to enter the mixing chamber where it is thoroughly mixed with air. As it leaves the mouth of the mixer it becomes ignited and serves its purpose. When it is desired to stop the burning the cut-off is turned to intercept the gas in its passage to the mixer.

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

1. In a vapor burner, the combination of a vaporizing chamber, the mixing chamber having closed sides and open bottom, the mixer suspended within the latter and having an open bottom and perforated sides for effecting communication between the interior of the mixer and the mixing chamber through the sides and bottom of the mixer, and the gas supply pipe leading from the vaporizing chamber and opening at a point beneath the mixer, substantially as described.

2. In a vapor burner, the combination of the annular vaporizing chamber, the mixing chamber formed by the inner wall of the first mentioned chamber, and the mixer consisting of a perforated cylinder having an annular flange projecting from its upper end and adapted to rest upon the inner edge of the walls of the vaporizing chamber, substantially as described.

3. In a vapor burner the combination of the burner proper, the annular generating

chamber surrounding the said burner, the said chamber having an annular groove formed in its top wall, and the annular plate seated in the said groove, substantially as described.

4. In a vapor burner, the combination of the burner proper, the annular vaporizing chamber surrounding the said burner and having the annular groove formed in its top wall, and the annular plate having a groove formed in its under side, seated in the first mentioned groove, substantially as described.

5. In a vapor-burner, the combination of the annular vaporizing chamber, the mixing chamber formed by the inner wall of the former, the mixer suspended in the mixing chamber, the pipe leading from the vaporizing chamber and opening at point beneath the mixer, the pan mounted beneath the mixer, and the cut off journaled on the said pipe and adapted to be interposed between the opening of the said pipe and the mixer, substantially as described.

6. In a vapor burner, the combination of the burner, proper, the annular vaporizing chamber surrounding the said burner, the deflecting plate, and the adjustable screws carrying the said plate, the top of the vaporizing chamber being provided with sockets for the reception of the ends of said screws, whereby said plate may be raised or lowered for regulating the space between the plate and the top of the vaporizing chamber, substantially as described.

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

SAMUEL E. FOLK.

Witnesses:

R. L. STARR,

C. A. BOWERSOX.