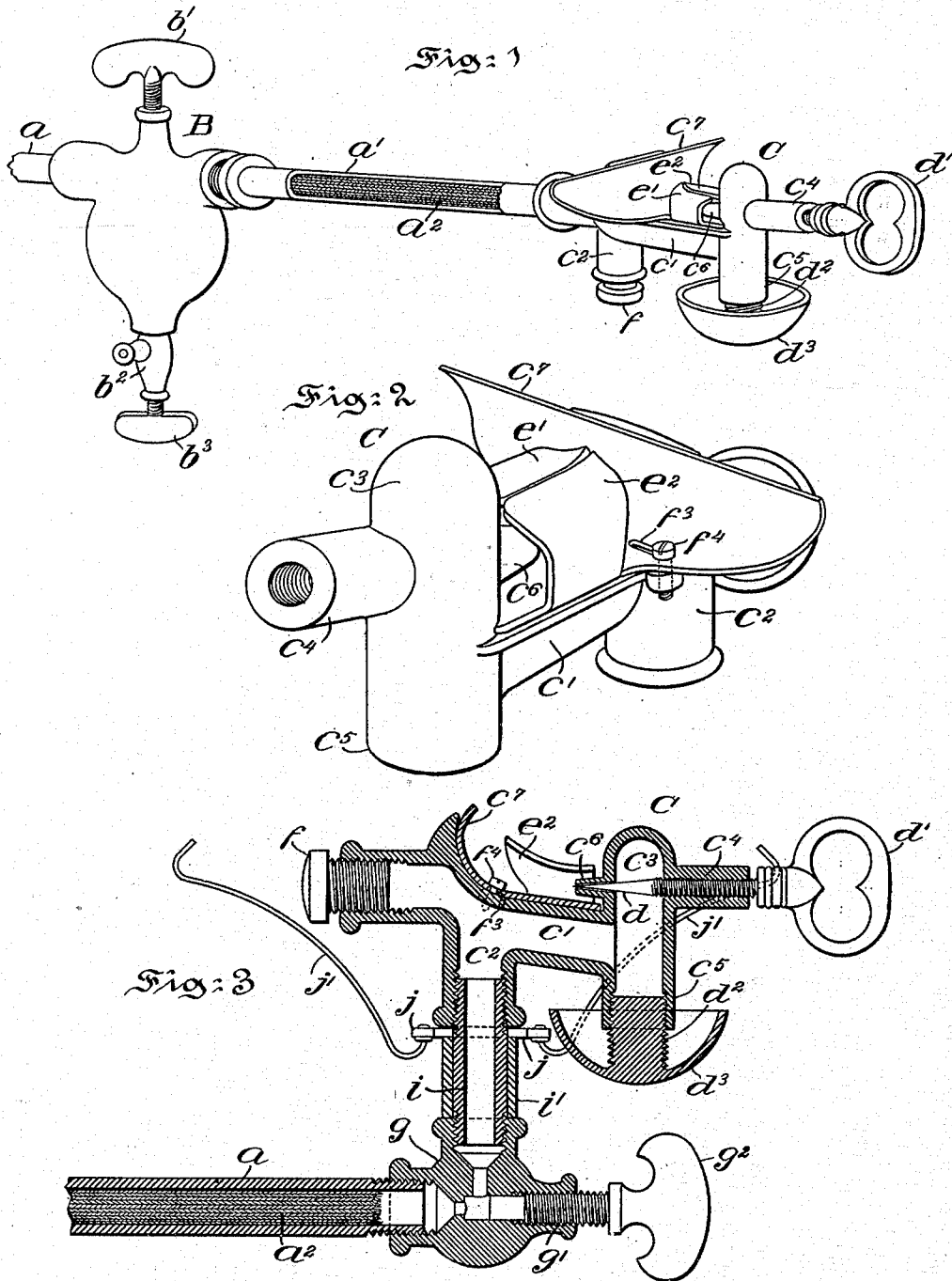


(No Model.)

W. M. LOCKHART
VAPOR BURNER.

No. 518,694.

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Witnesses:
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UNITED STATES PATENT OFFICE.

WALTER M. LOCKHART, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO J. WALTER DOUGLASS, OF SAME PLACE.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 518,694, dated April 24, 1894.

Application filed July 17, 1893. Serial No. 480,681. (No model.)

To all whom it may concern:

Be it known that I, WALTER M. LOCKHART, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a specification.

My invention has relation to that class of gas-burners which is adapted for vaporizing naphtha, gasoline and other hydrocarbon liquids; and it relates more particularly to the construction and arrangement thereof.

The principal objects of my invention are first, to provide a comparatively simple, durable and efficient vapor burner; second, to provide a vapor-burner in which the naphtha, gasoline or other hydrocarbon fluids are presented adjacent to the base of the burner to the generating chamber thereof, in order to expedite and insure a better vaporization and to afford better illuminating effects resulting from a given quantity of fluid utilized in the production of a flame at the exposed end of the burner in the presence of a mixing chamber; third, to provide a vapor burner with a laterally adjustable curved deflector plate for spreading the flame and with an air shield and mixing chamber connected therewith and located adjacent to a gas generating chamber and the naphtha, gasoline or other hydrocarbon fluid introduced into said chamber by means of controlled pipe connections from the front of the burner or hottest portion thereof, in order to enhance the character of vapor generated from the fluid passing therethrough, to reduce waste and to increase the illuminating properties derived therefrom; fourth, to provide a vapor-burner in which the several parts thereof are so constructed and arranged as to be readily detached for adapting the same for inside, as well as outside purposes; fifth, to provide a vapor-burner having the hydrocarbon or other fluids introduced into the same at a point in proximity to the hottest portion of the burner; and sixth, to provide a vapor-burner having the several parts so arranged as to be detached from the gas generating chamber provided with a contracted vapor discharge nozzle and regulator and having vertical and horizontal fluid inlet

conduits or channels leading to the chamber, the construction being such as to adapt the same to inside and outside purposes.

My invention consists of the improvements in vapor-burners hereinafter described and claimed.

The nature, scope and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a perspective view of a vapor-burner embodying features of my invention shown in application to a main provided with a globe-shaped water trap and with means connected therewith for regulating the supply of fluids to the main and for permitting of the discharge of water from the trap, the construction and arrangement of the apparatus therein shown is such that the same is especially adapted for use in street lamps. Figure 2, is a view in perspective of the burner proper detached from the main supply pipe or connection; and Figure 3, is a vertical longitudinal section of a vapor burner embodying features of my invention and adapted for the reception of a shade or globe for inside lighting purposes.

Referring to the drawings *a*, is a main supply pipe having detachably connected therewith a globe shaped watertrap and fluid regulator B, provided with a stop-cock *b'*, and with a blow-off valve or cock *b''*, having a cut-off key *b'''*. The section *a'*, of the fluid supply pipe *a*, is adapted for the reception of a wicking *a''*.

C, is the vapor-burner provided with an internal longitudinal channel *c'*, and a vertical channel or conduit *c''*, leading directly to the vaporizing or generating chamber *c'''*, with an internally threaded valve stem socket *c''''*, adapted for the reception of the threaded stem of the needle pointed cock *d*, having a key *d'*. The generating chamber *c'''*, has a contracted vapor nozzle or exit *c''''*, into the interior of which normally engages the tapering end of the cock *d*. The generating chamber has a depending threaded extension *c'''''*, which is adapted for the reception of the threaded integral neck *d''*, of the cup-shaped device *d'''*, for containing hydrocarbon fluid or

naphtha which is permitted to escape through the contracted vapor nozzle c^6 , of the generating chamber c^3 , into the same, in order that by the igniting of the same by radiation the generating chamber may be heated up for vaporizing the fluid escaping or forced into said chamber. Formed integral with the casting comprising the parts of the burner is a curved bearing plate for the reception of a laterally adjustable curved flame deflector plate c^7 , provided with wind or air shields e^1 and e^2 , bent in such manner as to form a hood and comprising a mixing chamber adjacent to the vapor discharge nozzle of the generating chamber c^3 . Into one end of the conduits or channels of the casting constituting the burner C, is inserted a threaded plug f , for a purpose to be presently fully described.

With special reference to Fig. 1, the flow of the naphtha or other hydrocarbon fluid from a suitable supply is through the pipe a , and trap B, under regulation, which is detachably connected with the section of pipe a' , containing a wicking to the burner proper. Any water carried into the pipe a and trap B, by reason of its specific gravity falls to the bottom of the trap B, and is discharged through the valve b^2 , by opening the cock b^3 . The fluid or naphtha passing through the wicking or analogous material a^2 , and regulating the supply of fluid to the generating or vaporizing chamber, passes in a curved direction through the internal conduit e' , of the burner proper and by operating the needle-cock d , by means of its key d' , the vapor generated in the first instance by the heating up of the chamber c^3 , is ignited, producing a flame at the exposed end of the contracted orifice c^6 , of the generating chamber c^3 . The vaporization of the fluid in the first instance, is obtained by permitting the fluid to flow through the generating chamber and to escape through the contracted flame orifice thereof in such manner as to drip into the cup-shaped device d^3 , when by igniting the same the generating chamber c^3 , is heated up so as to hasten the vaporizing of the fluid contained therein, and in order that by applying a flame thereto, the gas issuing from the exposed end of the contracted orifice c^6 , of the generating chamber c^3 , may be readily ignited. The pressure of the gas from the chamber c^3 , through its contracted nozzle c^6 , is under control, so that the flame presented to the deflector plate and mixing with the surrounding air may according to requirements be of greater or less intensity but of high illuminating power, by reason of the perfect vaporization obtained due to the particular arrangement above explained of the several parts of the burner C. The extent, however, of the flame can be regulated entirely by the operation of the needle cock d , by means of its key d' , as clearly shown in Figs. 1 and 3.

With reference to Fig. 3, is shown a slightly modified form of the burner such as is espe-

cially adapted for inside lighting purposes. In this instance the longitudinal conduit or channel c' , of the casting C, is closed by means of a screw threaded plug f , and the admission of the fluid to the internal gas generating or vaporizing chamber c^3 , of the device is from the supply pipe a , T-coupling g , provided with a stop-cock g' in a vertical direction, through the nipple i , detachably connected with the T-coupling, vertical and longitudinal conduits or channels c^2 and c' , to the generating chamber c^3 . Surrounding the nipple i , is a sleeve i' , for supporting to position a bracket j , provided with projecting arms j' , adapted to receive and hold to position a globe or shade, not shown. In the supply pipe a , is mounted suitable wicking or analogous material a^2 , for permitting to a greater or less extent of the regulation of the flow of the fluid therefrom to the T-coupling g , controlled as to the escape of fluid therefrom to the burner proper by means of the cock g' , by the turning of the key g^2 thereof. The fluid in this device for effecting vaporization in the first instance, is permitted by allowing a certain quantity of the same to flow there-through into the generating chamber and to escape therefrom through the contracted nozzle c^6 , by releasing the needle-cock d , whence it drips therefrom into the cup-shaped device d^3 , and by the application of a flame thereto it is ignited in such manner as that by radiation the chamber c^3 , is heated, in order to vaporize the fluid and continues under due regulation of the flow of fluid through the parts of the burner to maintain the required flame at the exposed end of the contracted orifice c^6 , of the generating chamber c^3 .

One of the main advantageous features of this device is the presenting of the fluid to the burner for vaporizing the same at the hottest portion thereof, in order to produce a flame at the exposed end of the contracted nozzle of the generating chamber, whereby the fluid is expeditiously vaporized and a flame of great intensity and high illuminating power is obtained. Hitherto in the use of vapor-burners, the fluid has generally been presented to the burner at the coolest portions of the same, so that vaporization has not only been slow, but the character of the flame obtained in the use of such burners has been of an inferior type. Practice has demonstrated that to overcome which, it is essentially requisite to present the fluid for producing a gas to be readily ignited at a point adjacent to the igniting point thereof, so that the same may not only be thoroughly vaporized, but the greatest number of units of efficiency obtained therefrom for lighting purposes. Moreover, the mixing of the air at the point of ignition of the issuing vapor from the generating chamber greatly enhances the illuminating quality of the gas produced in such a burner.

The burner of my invention possesses by reason of its construction and arrangement

the desirable features requisite for the expeditious vaporization of the fluid, the reduction of waste to a minimum and the obtaining of the greatest illuminating effect without requiring an abnormal amount of heat in and about the generating chamber for the obtaining of the results mentioned. The deflector plate as clearly illustrated in Fig. 2, is provided with an oblong slot f^3 , having a tightening screw f^4 , extending therethrough. This arrangement affords the means whereby the same may be set at an angle to the contracted flame orifice or vapor discharge pipe c^6 , in order to increase or lessen the area of the flame, which is desirable in some instances should be under perfect regulation from an illuminating standpoint and more especially in house lighting where a globe or shade is employed in connection with a burner of the type, for example, illustrated in Fig. 3.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—
 1. A vapor-burner comprising a generating chamber with a contracted flame or vapor orifice and means for controlling the flame therefrom, a fluid supply directly connected with said chamber in advance thereof and beneath the adjustable flame deflector plate, a horizontal conduit or channel leading therefrom and provided with a detachable plug, and means for regulating the supply of fluid to said device for controlling the vaporization thereof, substantially as and for the purposes set forth.

2. A vapor-burner provided with vertical and horizontal channels connected with a vertical dome-shaped generating chamber provided with a contracted flame or vapor discharge nozzle, and means for regulating the extent of flame therefrom, a curved seat for the reception of a deflector plate laterally adjustable in connection therewith and provided with a curved two part wind shield, substantially as and for the purposes set forth.

3. A vapor burner provided with a vertical dome-shaped generating chamber having an integral fluid supply conduit in advance thereof and having a plate connected therewith to permit the issuing flame through a contracted orifice to vaporize the fluid in transit to said chamber, a device for controlling the flame or vapor through said orifice, a receptacle connected with and depending from said chamber for the reception of fluid for hastening vaporization and for permitting of

access to said chamber, and means for regulating the supply of fluid to said conduit, substantially as and for the purposes set forth. 50

4. A vapor burner provided with a generating chamber having a contracted vapor exit nozzle, means for controlling the discharge therethrough, a fluid supply conduit in advance of said chamber and having a flame deflector plate seated to the wall thereof so as to vaporize the fluid in transit to said chamber, a receptacle provided with a shank engaging said chamber and adapted to contain fluid to hasten vaporization and removable to permit of access to said chamber, and means for regulating the supply of fluid to said chamber, substantially as and for the purposes set forth. 65 70

5. A vapor burner provided with a generating chamber having a discharge nozzle, means for controlling the flame or vapor therethrough, a fluid supply conduit connected with a coupling having a detachable nipple with a surrounding sleeve and engaging a conduit directly connected with said chamber, a flame deflector plate seated in advance of said discharge nozzle to the wall of said supply conduit so as to vaporize the fluid in transit to said chamber and provided with a wind shield and means connected with said coupling for regulating the flow of fluid through said supply conduit, substantially as and for the purposes set forth. 75 80 85

6. A vapor burner provided with a generating chamber having a contracted vapor or flame exit nozzle with means for regulating the flame or vapor therethrough, vertical and longitudinal conduits in communication with each other in advance of said generating chamber and one of them leading thereto and the other provided with a detachable plug, a flame deflector plate seated to one of said conduits in such manner as to permit of vaporization of the fluid in transit, a receptacle provided with a shank engaging said generating chamber for containing fluid for hastening vaporization and for permitting by the detachment thereof access being had to said chamber, substantially as and for the purposes set forth. 90 95 100 105

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WALTER M. LOCKHART.

Witnesses:

THOMAS M. SMITH,
 RICHARD C. MAXWELL.