J. KIDD.

Vapor Burner.

No. 87,680. Patented March 9, 1869.

Fig. 1

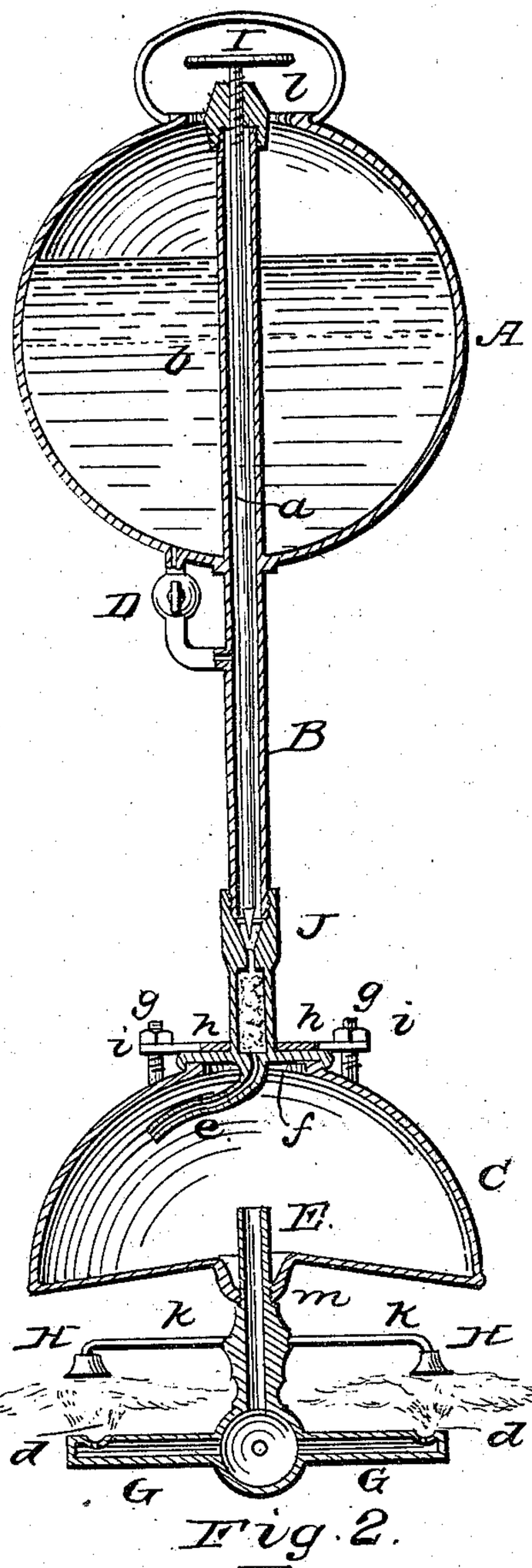
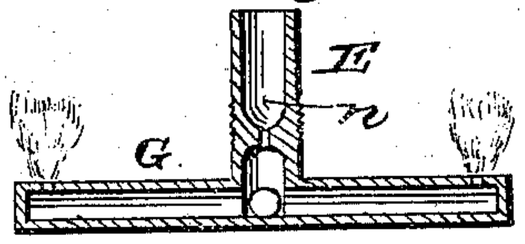


Fig. 2.



Witnesses
Wm Morgan
Philip. C. Dieterich

Inventor
Joshua Kidd
per Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

JOSHUA KIDD, OF NEW YORK, N. Y.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **87,680,** dated March 9, 1869.

To all whom it may concern:

Be it known that I, JOSHUA KIDD, of the city, county, and State of New York, have invented a new and Improved Apparatus for Vaporizing and Burning Heavy Fixed Oils; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a central vertical section of my invention. Fig. 2 is a detail section of an auxiliary burner.

Similar letters of reference indicate corresponding parts.

The object of this invention is to obtain an illuminating-gas by the vaporization of creosote or other heavy fixed oils, and to burn the gas so obtained, and by the heat of the burning gas continue the vaporization of the oil.

It consists, in general terms, of an oil-reservoir, communicating by a pipe with a vaporizing-vessel, which latter, in turn, communicates with burners, arranged so as to heat the vaporizer with the burning gas generated therein. The apparatus is provided with a means of regulating the flow of the creosote, together with other devices, perfecting the operation of the whole, as is hereinafter more fully set forth.

In the drawings, A is the reservoir, of any suitable form, as that shown. B is the tube or pipe by which the oil or creosote is conveyed from the reservoir to the vaporizer C, which latter, being heated, instantly vaporizes or gasifies the creosote or other fixed oil as it falls from the bent tube *e* upon the hot bottom of the vaporizer. The gas thus formed being under more or less pressure from its own expansion, and being compressed by the superincumbent oil in the reservoir, escapes through the tube E to the hollow arms G, and thence to burners *d*, affixed to or formed in the said hollow arms. The gas thus escaping, being lighted, evolves sufficient heat to maintain the vaporizer at the proper temperature for gasifying the oil, for both the heat and light obtained by the combustion of gas resulting from the vaporization of heavy fixed oils are intense. This is particularly true when creosote or oil of tar—a cheap residual product obtained in the manufacture of coal-gas—is used, and which, from its exceeding cheapness, I contemplate using in preference to other heavy fixed oils or analogous products which may be vaporized and burned in my apparatus.

In order to increase the effect of the light, I employ deflecting disk or buttons H, arranged in any suitable manner above the flames from the burners, so that the flames will impinge against them and be spread out horizontally in broad circular sheets. This spreading of the flame is advantageous in several respects. First, it exposes the flame to the air, thereby increasing its surface for more complete oxidation; second, it increases the quantity of light shed downward when the apparatus is elevated or fixed in a position overhead, as is usually the case in practice, as "sun-lights," so called; third, the disks serve to prevent the excessive heating of the vaporizer, and thereby preserve an equitable degree of temperature in the same.

The other details of construction shown in the drawings are—

First, the strainer *b* in the reservoir A, for the purpose of straining the oil of any extraneous matter before it passes into the vaporizer.

Second, the stop-cock D communicating with the reservoir A and pipe B. By means of this cock the discharge of the oil can be regulated as circumstances may require, or shut off altogether to extinguish the light.

Third, the short joint of tube J forming part of the cap and tube *e*. The tube B is screwed into this joint, as shown.

The said joint J is usually formed with a conical seat or contracted orifice, *j*, for the purpose of restraining the too rapid flow of oil to the vaporizer. Beneath this conical seat the bore of the tube-joint J is enlarged, to contain a small quantity of coke, in grains, or other similar porous substance, through which the descending oil filters before it passes through the tube *e* to the vaporizer. This filtration of the oil is not absolutely necessary, but is beneficial where crude creosote is used, as it in a measure extracts the residual elements existing therein.

The cap *f* closes the upper orifice of the vaporizer gas-tight, and may be fitted thereto with a screw-thread, or in other suitable manner; but I find, in practice, that a good and simple joint is obtained by fitting the cap and the annular lip of the orifice of the vaporizer with a smooth surface, and holding the cap firmly in contact with the said annular lip by means of a bar, *h*, which incloses the joint J loosely, and which is formed with holes near its ends, through which the threaded studs *g*, affixed rigidly to the vaporizer, pass loosely, the said bar being held against the cap by nuts *i* working in the said threaded studs. This joint, if properly made, will require no luting or cement of any kind.

The tube *e* is deflected from the axis of the apparatus, so as to discharge the oil upon the hot bottom of the vaporizer, and not into the gas-tube E, which is usually in the axis of the apparatus.

The disks or buttons H are supported over the flame by arms *k* from the tube E; and if it is desired to allow the flames of the several burners to impinge directly upon the bottom of the vaporizer, in order to increase the temperature of the latter, the tube E, being fitted to the vaporizer with a screw-thread, *m*, may be turned a short distance to bring the burners away from their respective disks, and thus allow the flames to act directly upon the vaporizer, as aforesaid.

Fourth, the flow of oil into the reservoir is regulated by means of a pointed rod, *a*, passing loosely down the whole length of the tube B, with its conical point fitting somewhat loosely in the conical seat *j*, before mentioned. The upper end of this rod is formed with a screw-thread, which works in a corresponding hollow thread cut in the cap *l* of the tube B. I is the handle for turning the rod, to raise or lower its point in the conical seat *f*.

Fifth, the bottom of the vaporizer is made conical, as shown, for the purpose of collecting the residual products of vaporization away from the gas-tube E when such products occur.

When the oil is properly prepared by distilling it over in a retort and condensing it, the grosser part, which constitutes the residual elements of the oil, will be left in the retort, and thus eliminated from the oil, which will then undergo vaporization with but very slight residual deposit in the vaporizer.

The burners shown in the drawings consist only of the horizontal tube or tubes G, having orifices *d* for the gas to escape; and while such burners will answer comparatively well for most purposes, other and better ones may be used. In practice, I employ any of the burners commonly used, as the "fish-tail" burner and "bat-wing" burner, so called.

At Fig. 2 is shown a modification of the tubes E and G, for the purpose of dispensing with the disks H and using any common burners, as aforesaid. In this attachment the bore of the tube E is contracted, as shown at *n*, so as to reduce the pressure of the gas in passing through the burners. The said attachment is fitted with a screw-thread to affix it to the vaporizer.

From the foregoing it will be observed that the spirit of my invention relates to and comprises the production of artificial light by vaporizing and burning creosote or other heavy fixed oils or hydrocarbons, which vaporize or gasify only at a high temperature, such as the heavy or dead oils of tar, naphthaline, heavy oil of petroleum, candle-stock, (so called,) or other analogous heavy fixed oils, which have been heretofore of little commercial value; and in the said invention the heat requisite to maintain and carry on the said vaporization of these substances is afforded by the illuminating-flame produced by the combustion of the said gas or vapor acting on the vaporizing-vessel of the apparatus; and I desire to be understood as not limiting the invention to the precise form of apparatus as above shown, for the same may be variously and differently modified, constructed, or arranged to produce the same result; nor do I desire to be understood as limiting myself to the manner of constructing the particular apparatus herein shown and described, as the same may be differently constructed, and provided with accessory apparatus for mixing common air or oxygen gas with the flame to promote the combustion of the same more perfectly, together with other elaborations of the same invention, as is set forth in the specification filed by me in the Great Seal Office of Great Britain, in pursuance of the required conditions for obtaining English Letters Patent, which Letters Patent have been granted to me, although the printed specification pertaining to the same has not yet been published.

In conclusion, I will note that in using my invention the vaporizer C must be heated over a flame, or in any other manner, to a temperature sufficient to vaporize the oil before the cock D is turned to let the oil into the vaporizer. This heat, in practice, is imparted by a spirit or other lamp or a furnace, and when sufficiently hot—say 400° Fahrenheit—the oil is turned in and gas formed, which, issuing from the burners, is ignited, and the flames of which then are sufficient to maintain the temperature of the vaporizer at the required degree.

To clean the vaporizer of any residual deposit that may have accumulated therein, the tube B is unscrewed and the cap *f* removed, and the deposit scraped out or removed by any spiritual solvent.

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

1. An apparatus for vaporizing and burning creosote or other heavy fixed oils or hydrocarbons for illuminating purposes, wherein the said creosote, oils, or hydrocarbons are admitted sparingly from a reservoir, A, into

a vaporizing-vessel, C, the temperature of which latter is maintained by the heat of the illuminating-flame obtained by the combination of the gas so formed, substantially as herein shown and described.

2. The combination of the reservoir A, tube B, cock D, tube-joint J, rod *a*, cap *f*, vaporizer C, tubes E G, burners *d*, disks H, or the equivalent of any one or all of these said parts, when combined to form an illuminating apparatus, substantially as set forth.

The above specification of my invention signed by me this 18th day of September, 1868.

JOSHUA KIDD.

Witnesses:

FRANK BLOCKLEY,

ALEX. F. ROBERTS.