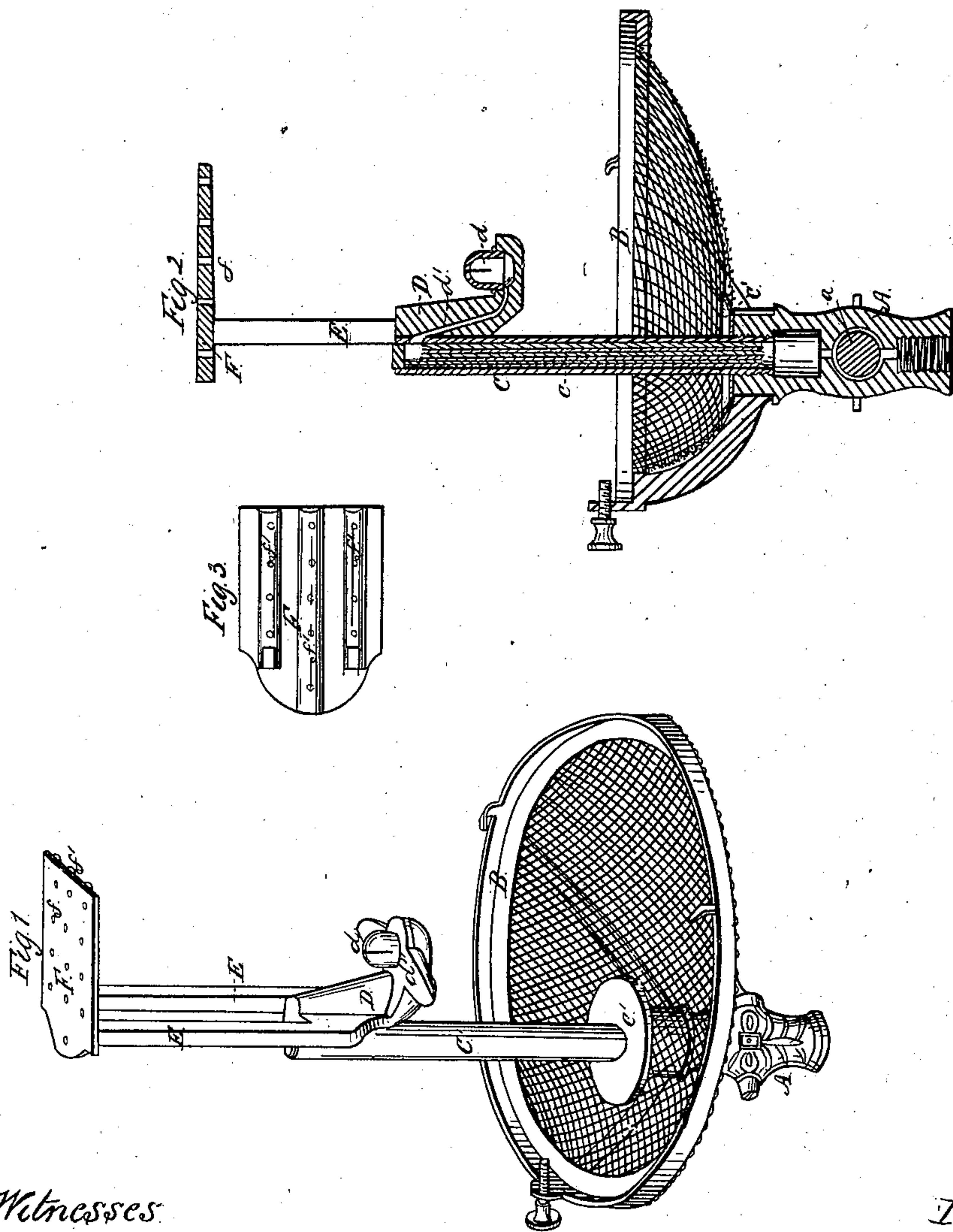


No. 30,965.

PATENTED DEC. 18, 1860.

J. S. GRAY.  
SELF GENERATING VAPOR BURNER.



Witnesses:

A. P. P. P.  
J. S. Johnson

Inventor:

James S. Gray  
By his Attorney  
W. D. Baldwin



# UNITED STATES PATENT OFFICE.

JAMES S. GRAY, OF NEW YORK, N. Y.

## VAPOR-LAMP.

Specification of Letters Patent No. 30,965, dated December 18, 1860.

*To all whom it may concern:*

Be it known that I, JAMES S. GRAY, of the city, county, and State of New York, have invented a new and useful Improvement in Self-Generating Vapor-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view, in perspective, of a self-generating vapor burner embracing my improvement. Fig. 2 represents a vertical, transverse, axial section through the same, and Fig. 3 represents a view of the under side of the heater-cap.

My invention relates to that class of vapor burners or lamps in which the fluid from which the vapor is generated is contained in a reservoir situated at a distance from the burner and conveyed to it by a pipe; in order that the main body of the fluid may not be exposed to the heat of the flame; whereby, the liability to accidents is greatly diminished. Owing to its many advantages this class of burners is now very generally used; and numerous attempts have recently been made to improve their construction and mode of operation; but, so far as my knowledge extends, they are all deficient in some of the elements essential to successful operation. In these burners, as heretofore constructed, the wick tube is carried up above the level of the jet or tip of the burner; and in many instances a chamber is formed immediately above the flame into which the fluid flows and is converted into vapor. This method of construction is, in my estimation, objectionable for many reasons. From the number of pieces of which such burners are necessarily composed; and from the extent of surface they present to the heat, they are very liable to get out of order and to become leaky from the constant working of the joints, caused by the expansion and contraction of the tubes. Moreover, whenever these burners are exposed to a draft sufficiently strong to deflect the flame against the wick-tube, the latter soon becomes so hot as to char the wick, which charring causes the wick to become gummy and clog, necessitating frequent changes.

It is the object of my invention to provide a burner which while combining the advantages of the class of burners above mentioned, shall yet be free from the defects

incident to their mode of construction. To this end I employ a wick-tube of the kind in general use, and connect it with a reservoir of burning fluid in any suitable manner. To the upper part of this wick-tube a bracket or nib containing the vapor-tube and burner is attached in such manner that the burner shall be placed somewhat below the upper part of the wick-tube, but not so far that the bright part of the flame may not rise above it.

A cap which is heated by the flame of the burner is supported a suitable distance above it by means of solid bearers which also answer the purpose of conductors to convey the heat from the cap to the wick-tube. The cap may be corrugated or have ribs or flanges cast upon its under side to increase its heating surface. It may also be perforated in order that the heated air from the flame may pass through the holes in it, and thus increase its temperature. The flow of the fluid through the wick-tube may be regulated by means of a suitable cut-off.

In the accompanying drawings my improvement is represented as applied to a burner intended to be used at a distance from and below the reservoir of fluid. The supply-pipe A, is connected with the reservoir and provided with a stop-cock *a*, of the V-variety—that is to say, the plug is made solid and has a V-shaped groove passing partially around its periphery. This groove gradually increases in size from one end to the other so that the flow of the fluid may be regulated at will by turning the plug in its seat. A stand and circle B, may be placed upon the supply-pipe to support a globe or shade; and a screen of wire-gauze may be secured to the circle or ring to prevent the flame from being deflected by too great a rush of air.

A wick-tube C, is securely attached to the supply-pipe, and provided with a wick *c*, to convey the fluid to the generator or chamber at the upper part of the tube. The wick should extend to a point a short distance below the level of the vapor-tube *d'*, for if carried up to the same level it would be more liable to become charred, or to cause an overflow of the fluid. A lighting-cup or dish *c'*, may also be placed upon the wick-tube.

A bracket or nib D, is attached to the upper part of the wick-tube; which bracket projects downward a short distance and sup-



ports the burner-tip  $d$  which communicates with the wick-tube through a channel  $d'$ , in the bracket. This bracket serves to absorb and retain the heat from the flame and aids materially in the volatilization of the fluid; it forms what I term the "back-heater." The tip  $d$ , is inserted into its seat in such manner as to admit of its ready removal or replacement. Wings or horns  $d^2$  may be provided to assist in spreading the flame, and accumulating heat.

Two solid standards or conductors E, project above the bracket and support a heater-cap or plate F. These conductors I prefer to make oblong or oval in their cross-section, and to place them with their thin edge toward the flame, in order that they may cast as little shadow as possible. The heater F is supported directly over the burner-tip, but at such distance therefrom as not to interfere with the diffusion of the light; and yet near enough readily to absorb the heat evolved by the flame. This distance will, of course vary with the size of the burner employed. The heater-cap in this instance is represented as provided with parallel ribs or ridges ( $f'$ ) to increase the extent of its heating surface. The same end would obviously be attained by corrugating the cap; but not, in my judgment, in so advantageous a manner. I also perforate the cap with numerous small holes  $f$ , through which the heated products of combustion may pass and thus serve to heat the cap more thoroughly. I prefer to cast the bracket, conductors and heater-cap all in one piece as it renders the conduction of the heat more perfect and lessens the cost of construction of the burner.

The operation of the burner is as follows: The reservoir being supplied with fluid, and the wick properly arranged in its tube, the stop-cock  $a$ , is opened, the fluid then rises in the wick-tube C, nearly to its top. The burner may then be lighted either by a torch, or by pouring a small quantity of alcohol or fluid into the cup  $c$ , and igniting it. The heat thus generated converts the fluid in the

wick-tube into vapor which flows through the channel  $d'$ , and escapes through the jet  $d$ , where it is inflamed. The flame of the burner soon heats the bracket D, and heater-cap F, especially the latter, the heat from which is communicated rapidly to the wick-tube by the conductors E. Thus the lamp becomes in a few moments a self-generating one and will continue to burn as its supply of fluid is kept up; which supply can readily be adjusted to the quantity of light desired by means of the groove in the stop-cock. The light will of course continue to burn (even after the stop-cock is entirely closed) until the fluid already in the wick-tube is evaporated; or, until the tube becomes cold.

The burner may be cleaned at any time by unscrewing the wick-tube, removing the burner-tip from its socket, and a plug or screw from the top of the wick-tube and passing a wire or other suitable instrument through the openings.

It will thus be seen that by my improved combination and arrangement of parts I am enabled to obtain a burner combining the qualities of simplicity, cheapness, efficiency, and utility in a high degree; and one which at the same time is capable of being made an ornamental as well as a useful fixture.

I do not claim broadly under this application any of the above-mentioned devices *per se*, but

Having thus fully described the construction and operation of my improved burner what I do claim therein as new and desire to secure by Letters Patent, is—

The combination of the wick-tube C, bracket D, conductors E, and heater-cap F, when arranged for joint operation substantially in the manner described for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

JAMES S. GRAY.

Witnesses:

ALEX. J. WALKER,  
JOSIAH WATERMAN.