F. W. WILLARD.

Vapor Burner.

No. 30,899. Patented Dec. 11, 1860.

Fig. 3.

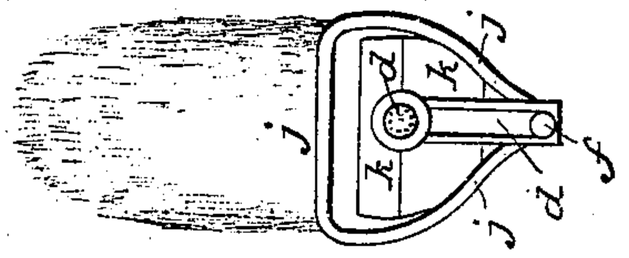


Fig. 2.

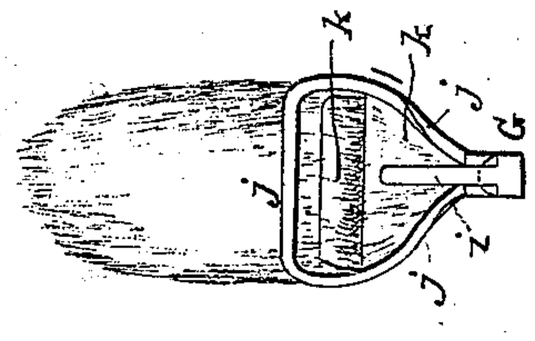
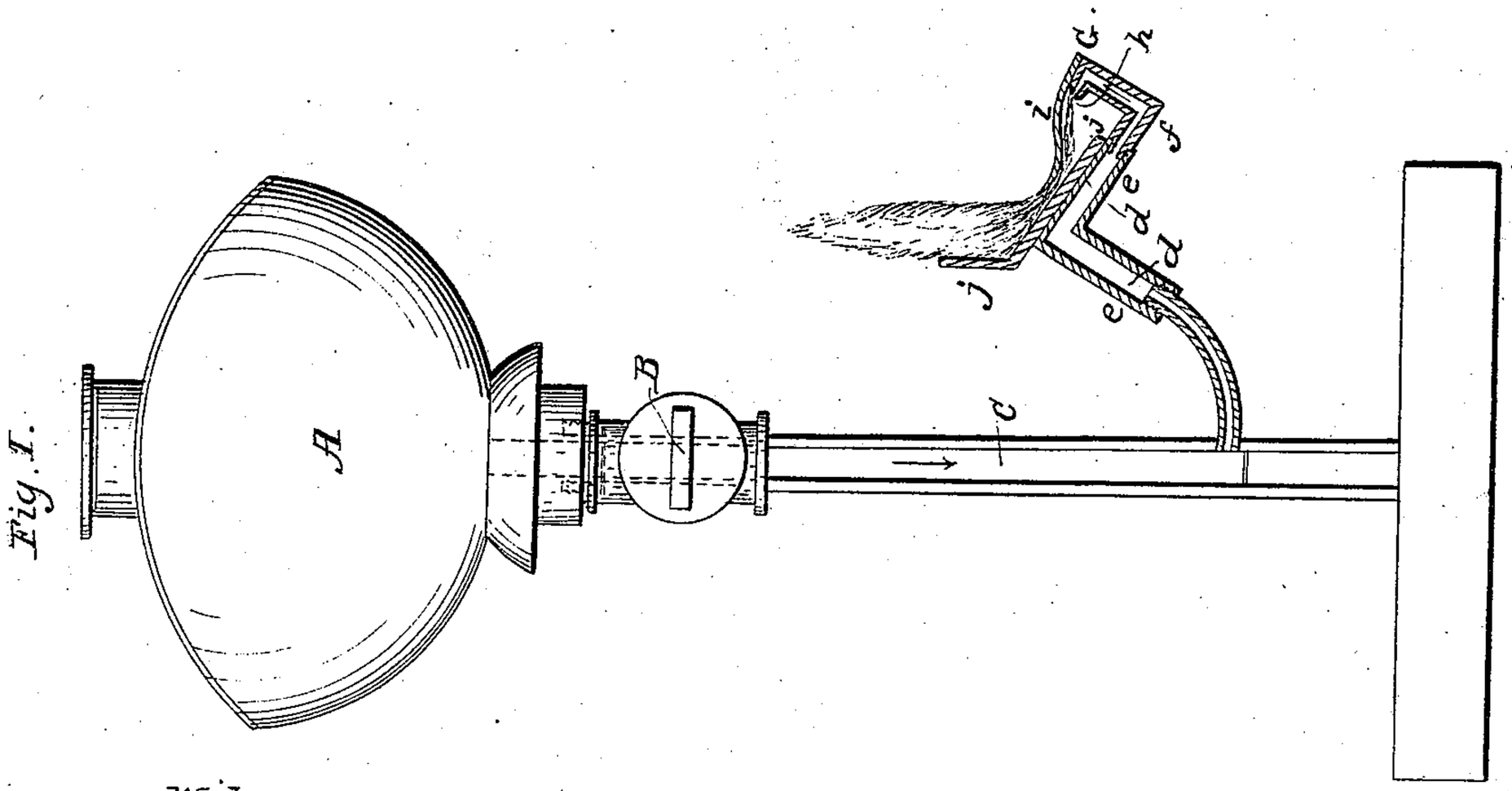


Fig. 1.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANKLIN W. WILLARD, OF NEW YORK, N. Y.

VAPOR-LAMP.

Specification of Letters Patent No. 30,899, dated December 11, 1860.

To all whom it may concern:

Be it known that I, FRANKLIN W. WILLARD, of the city, county, and State of New York, have invented a new and useful Improvement in Vapor-Lamps; and I do declare the following to be a clear and exact description.

The lamp is constructed by elevating a fountain which contains the oil at such a height above the burner as to give the required amount of pressure on the column of oil, which is necessary to resist the backward force of the vapor in the vapor chamber. The flow of oil through the feed pipe from the fountain to the burner being regulated and cut off by means of a stop cock placed on the feed pipe between the fountain and burner. The burner, which is screwed on to the lower end of the feed pipe is constructed of copper or other metal or composition which is a good conductor and retainer of heat. A piece of metal about one inch square and about a sixteenth of an inch in thickness is cut into the shape desired and of a size to be covered only by the blue portion of the flame this piece of metal after being shaped as desired, is bent or crooked through the center. Surrounding this bent plate is a wire bent in shape to correspond with the edges of the bent plate. The wire is raised above the top edge of the bent plate so as to leave a space between the top of the plate and the wire by forming a draft between the plate and the wire which serves to submit the wire to a greater degree of heat. The ends of the wire are brought down to the lower point of the bent plate and brazed on to a metal tube this tube being fitted to is brazed on to the back side of the bent plate the upper end of the tube being connected to the feed pipe and the lower end which projects below the bent plate is connected with an elbow by means of a screw. The other arm of the elbow pointing upward is furnished with a nipple. Through this nipple and pointing directly toward the perpendicular part of the bent plate is an annular opening. From this opening and leading into the elbow and from thence into the metal tube is a passage. This tube which is brazed on to the back side of the bent plate is filled and packed with fine drawn wire which answers the purpose of a vapor chamber. Over the nipple and pointing toward the perpendicular part of the bent plate is a strip of metal.

The burner being thus completed is screwed on to the lower end of the feed pipe and being heated with the flame of an alcohol lamp which may be connected permanently to the vapor lamp or otherwise. The oil let into the feed pipe is brought in contact with the fine drawn wire in the tube which forms a porous core through which the oily vapor passes on its way to the burner is instantly converted into vapor and being driven through the passage of the elbow out of the annular opening is forced against the strip of metal which is fastened to the nipple and points toward the perpendicular part of the bent plate. From thence it is forced down and striking the inclined portion of the bent plate the force of the jet being broken by the strip of metal. The vapor is spread and directed as it strikes obliquely on the surface of the inclined part of the plate, where it becomes partially mixed with atmospheric air and is there partially ignited. The vapor and flame rushes against the perpendicular portion of the plate and is spread into a wider and thinner sheet and after leaving the plate rises above the wire over the top of the plate. The flame then assumes a bright color and burns with great brilliancy and persistence, the heat which is necessary to heat the burner to vaporize the oil being used from the blue portions of the flame and not taken at the expense of the light, as the plate should be made no larger and of a shape to be covered by the blue portion of the flame. The heat which is imparted to the wire which surrounds the plate is conducted by the wire to the lower part of the tube and elbow to keep up heat on that portion of the burner and thereby prevent the condensation of the vapor after it has been generated by passing through the tube filled with fine drawn wire.

Having thus given a general description of my invention, I will now give a more particular description in detail reference being had to the drawings and figures annexed.

Figure 1 is a representation of the lamp standing on its pedestal and a side view of the burner showing the inside of the tube filled with fine drawn wire and passage leading from the vapor chamber to the annular opening in the nipple likewise the strip of metal used for distributing and breaking the force of the jet of vapor. A is the foun-

tain used to hold the oil. B, shows the stop cock used for regulating the flow of oil through the channelway C. D, shows the inside of the metal tube brazed on to the backside of bent plate K. *f* is the elbow and the arrow shows the direction of the vapor in its passage from the vapor chamber inside of tube *e* to the annular opening *n*, in the nipple G. I is the strip of metal used for breaking the force of the jet of vapor and spreading it obliquely on the bent plate K. J shows the wire which surrounds the bent plate and is used to keep up the heat on the lower portion of the burner thereby preventing condensation of the vapor in its passage from the vapor chamber through the elbow to the nipple. The black lines in side of metal tube *e*, shows the position of the fine drawn wire which forms the porous core.

Fig. 2 is a front view of the burner showing bent plate K surrounded by the wire J and the strip I and nipple G.

Fig. 3 is a rear view of the same showing the end of the metal tube filled with fine drawn wire, the wire J the bent plate K, the inside of vapor chamber *d* and elbow *f*.

Having thus given a description of my invention, I wish it understood that I do not claim an elevated fountain for holding oil nor do I claim a stop cock for regulating the flow of oil into a burner, nor a feed pipe to convey oil from a fountain, nor a tube filled with wire, for these have all been described before and their particular uses and purposes set forth, but

What I do claim and desire to secure by Letters Patent is—

The combination of the bent plate K strip of metal *i* and the wire J constructed and operating for the purposes and uses substantially as set forth in the specification.

FRANKLIN W. WILLARD.

Witnesses:

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A. C. SUMMERS.