I. T. BEALE.

Vapor Burner.

No. 1,023. Patented Nov. 25, 1838.

Fig. 1

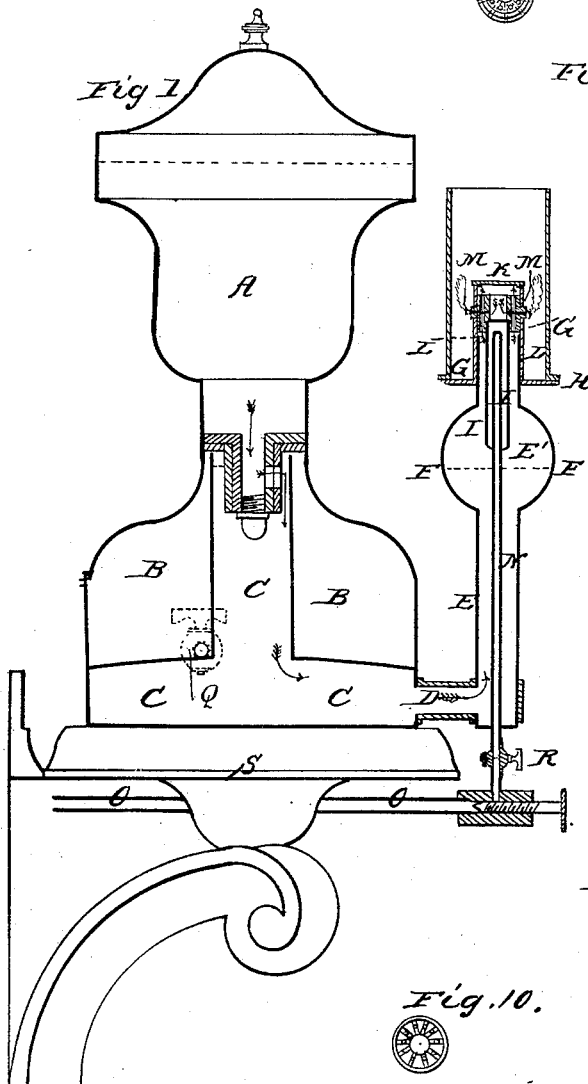

Fig. 2.

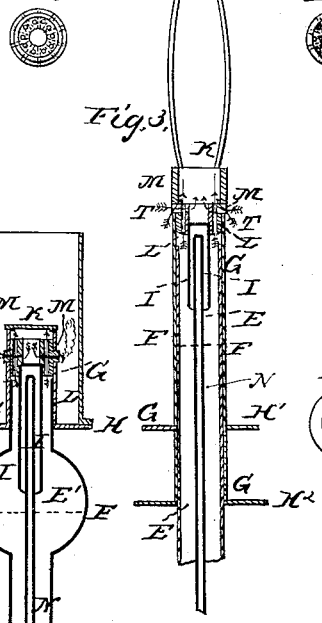

Fig. 3.

Fig. 4.

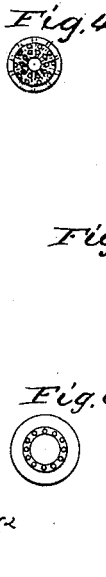

Fig. 5.

Fig. 6.

Fig. 7.

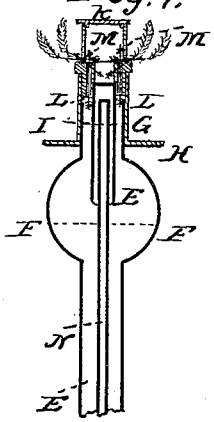

Fig. 8.

Fig. 9.

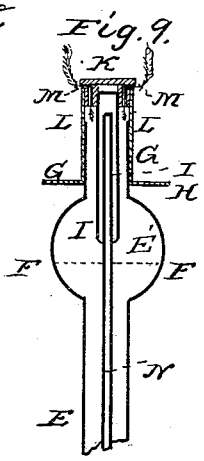

Fig. 10.

Witnesses

J. W. Moffatt
H. Watson

} Bleak to Norton & Bevy.

Inventor.

I. T. Beale

UNITED STATES PATENT OFFICE.

JOSHUA T. BEALE, OF GREAT BRITAIN.

LAMP.

Specification of Letters Patent No. 1,023, dated November 29, 1838.

To all whom it may concern:

Be it known that I, JOSHUA TAYLOR BEALE, a subject of the Queen of Great Britain, and now residing in Church Lane, Whitechapel, in the county of Middlesex and Kingdom of England, have invented or discovered a new and useful invention of a lamp applicable to the burning of the vapors of certain fluids in conjunction with atmospheric air or certain gases and for the application of the same; and I do hereby declare that the following is a full and exact description thereof.

First: As to the lamp for the better elucidation of which diagrams in section on a half scale from the models they have been taken from are annexed to this my specification.

Figure 1 shows a side light. This burner is divided into two parts the lower part or cup marked E is made of very thin sheet iron thinner than an ordinary visiting card indeed as thin as it can consistently be made and is about 6 inches in length more or less and five eighths of an inch in diameter but these proportions may be varied according to the size of the burner required. This cup may be made with or without the globular part E′ as shown in the different figures of the drawing. The advantage of the globular part being to allow a larger space for the mixture of air and vapor or air and gas and vapor as the case may be. Into this cup passes the fluid through the channel marked D as high as shown by letter F which is one eighth of an inch more or less below the level of the top of the overflow pipe shown in the body of the lamp over which overflow pipe the surplus fluid (in case of any leakage or mismanagement) passes into the reservoir B which reservoir should be made sufficiently large to hold the contents of reservoir A. C is the chamber which receives the supply of oil from the reservoir A which is made to feed the lamp upon the principle of an ordinary Argand reservoir lamp. Up the center of the cup E and through the fluid passes the small air pipe or air and gas pipe as the case may be marked N and which pipe I prefer made of thin sheet iron and carried to the height as shown in the drawing. The upper part of the burner G which is made to slide on the lower part or cup E is made of iron or brass and through the top part of which holes are perforated as shown in the different figures in the drawing. The holes encircling the inverted tube I and which come inside the cup E are to admit the combustible mixture into the top part of the burner K, in the center of which an inverted tube marked I the bottom of which is contracted as shown in the drawing is made to screw. The air pipe N which passes up this inverted tube allows the air or air and gas mixed as the case may be to pass into this tube which being closed at the top consequently causes such air or air and gas as the case may be to be forced downward upon the surface of the fluid and thereby forcibly to be mixed with the vapor which mixture then passes up through the inner circle of small holes L into the top part K where it has again to pass through other holes as shown by the arrows in the drawing before it gets consumed. The top part of the burner K with the inverted tube I screwed through the center of its bottom is placed upon the tube G which is made to slide up and down over the inner tube or cup E so as to enable the adjustment of the distance between the top part of the burner and the fluid which varies according to the nature of the fluid used. H, the gallery which supports the glass which is attached to the bottom part of the burner G. L the holes perforated through the bottom of the top part K encircling the inverted tube I and shown by the upright arrows. M the holes perforated through the sides where the combustible mixture passes through to be consumed after having passed through the holes L and shown by the horizontal arrows. O is the main air or air and gas pipe into which the small pipe N is fixed in order to receive the supply. P a regulating screw acting as a cock to adjust the supply of air. Q a cock for drawing off the overflow from reservoir B. R a small cock to turn the air on and off. S a bracket supporting the lamp. This lamp may be variously modified in confirmation of which I have shown a few varieties in the drawings subjoined to this specification and which I have found to answer. The object being whatever be the shape given to the burner to supply a regular sufficiency of heat to the upper part of

the fluid in the cup and to regulate the rush of air or air and gas as the case may be according to the evaporation taking place.

Fig. II shows a plan of the perforation used in the burner Fig. I.

Fig. III shows a burner with an upright light with the head of the top K open. It has a third series of holes perforated marked T in the direction shown by the angular arrows. The cup E in this burner being made without the globular part the sliding tube G is brought down to the part marked H^2. H^1 is the gallery for the glass which is made to slide up and down over the sliding tube G.

Fig. IV shows a plan of the perforations used in this burner.

Fig. V shows a burner with an upright light with only one series of holes L shown by the upright arrows. The top part K is open at the head and slightly contracted. This burner is not adapted for so large an admixture of gas with the atmospheric air as the others will admit of.

Fig. VI shows a plan of the perforations used in this burner.

Fig. VII shows a side light in most respects similar to Fig. II, the drawing clearly showing wherein it chiefly differs—viz., by another row of lights proceeding from the holes shown by the arrows drawn at right angles and pointing upward.

Fig. VIII is a plan of the perforations used in this burner.

Fig. IX shows a side light burner with the holes L and M closer to the top.

Fig. X is a plan of the perforations used in this burner. I will here observe that when I increase the size of the lamp or burner I have found it useful with some of the oils to fix fangs or prongs to the end of the inverted tube so as to dip into the fluid thereby promoting the evaporation.

Secondly: As to the fluids and the application of the gases in conjunction with the same, in this lamp I consume certain fluids obtained by the distillation and occasionally rectification from coal for vegetable tar, animal oil, turpentine resin, india-rubber, bitumen, mineral naphtha, petroleum, asphaltum, and some other of the inflammable oleaginous or resinous substances by mixing with the vapor of the volatile oils obtained from these substance either atmospheric air alone or a mixture of air and inflammable gas such as coal gas and others. When I use atmospheric air alone and wish to burn the coarser volatile oils I first heat the burner (which is not necessary with the finer volatile oils) so as to produce sufficient vapor to become combustible and to do this—namely, to heat the burner—I have recourse to a little very fine volatile oil such as coal tar naphtha of the better kind which I pour into that part of the burner called the cup upon the coarse oil after which I turn on the atmospheric air and apply a light to the issue of mixed air and vapor. This method of lighting the lamp need not be resorted to when a mixture of air and inflammable gas is used in such proportions as will render the mixture inflammable so as to burn with flame when light is applied which will heat the burner and cause the vapor to rise after which the light becomes regular and bright with the assistance of a proper pressure on the air holder which may be made in the form of a gas-holder the force or pressure on which is about an inch more or less perpendicular of mercury, varying, however, according to the bore of the pipe. The air also (or air and gas mixed) may be used in a highly compressed state after the manner of portable gas.

I find that about 15 per cent., more or less, of coal gas is a sufficient proportion of gas to be added to the atmospheric air so as to burn with flame or such proportion of any other suitable combustible gas may be used as will produce the same effect; but I do not confine myself to such proportion. I need not say that it will be prudent to avoid such proportions of air and gas as are explosive; but if such explosive mixture be used a fine wire gauze must be placed in the supply pipe to each lamp so as to avoid the possibility of explosion.

The air (or air and gas) may be supplied by a single or double acting air pump or by any other means for forcing air or air and gas.

The manner in which inflammable gas and atmospheric air are mixed is too well known to require any description in this place.

I therefore claim as my invention—

The aforesaid lamp with its several modification—containing the inverted tube I, and combined with the cup and their burners in the manner set forth, and combined with the apparatus described, for the supply of gas, or of atmospheric air, to be mixed with the combustible vapor in the manner described.

In witness whereof I, the said Joshua Taylor Beale, have hereunto set my hand and seal this 16th day of June 1838.

J. T. BEALE. [L. S.]

Witnesses:
M. Moffats,
W. Watson.