J. J. RIDDLE.

VAPOR LAMP.

No. 46,266. Patented Feb. 7, 1865.

Fig: 1.

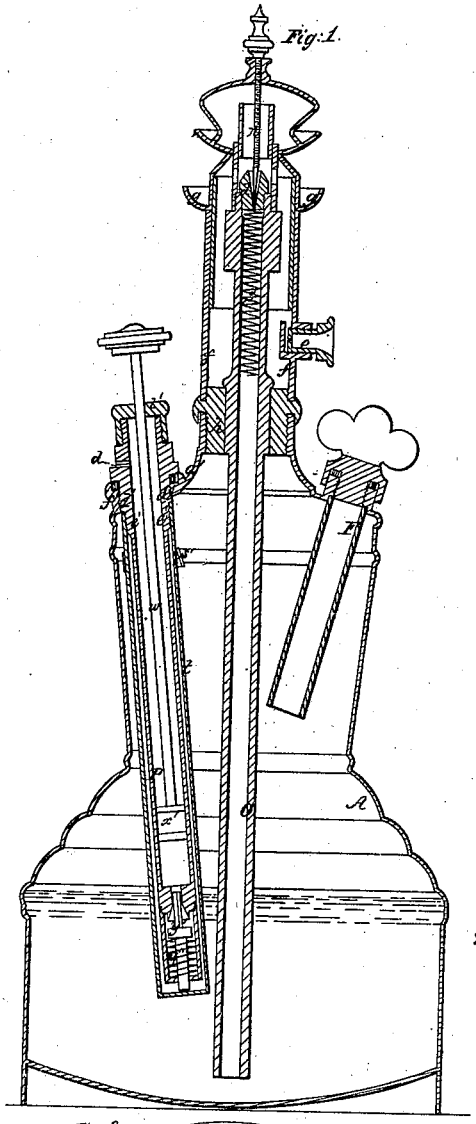

Fig: 3.

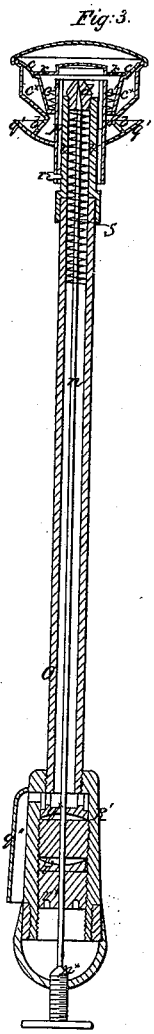

Fig: 2.

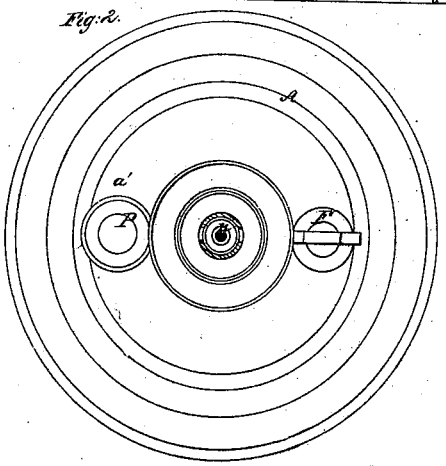

Fig: 4.

Witnesses;
Henry Morris
Geo. W. Reed

Inventor;
J. J. Riddle
per Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

J. J. RIDDLE, OF CINCINNATI, OHIO.

IMPROVEMENT IN VAPOR-LAMPS.

Specification forming part of Letters Patent No. **46,266**, dated February 7, 1865.

To all whom it may concern:

Be it known that I, J. J. RIDDLE, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Vapor-Lamp; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal vertical central section of my invention, with needle working from the top. Fig. 2 is a horizontal section of the same. Fig. 3 is a detached longitudinal central section of my burner and oil-tube, with the needle arranged from below the bottom of the lamp. Fig. 4 is a transverse vertical section of the burner, as shown in Fig. 3.

Similar letters of reference indicate corresponding parts.

The object of this invention is a vapor-lamp which combines cheapness and simplicity, with few or no joints liable to work loose, and in which all the parts are so arranged as to be repaired easily and quickly.

The nature of my invention and its peculiar advantages will be readily understood from the following description.

A represents a reservoir, made of sheet-brass or other strong and durable material, in the shape shown in the drawings or in any other convenient form or shape. The lower portion of this reservoir is occupied by the oil or burning-liquid, and its upper portion forms the air space. The burning-liquid is introduced through the filler F, and the air in the air-space is compressed by means of an air-pump, P, which is introduced through the top a' of the reservoir A, and extends down near to its bottom. The air pressing upon the surface of the burning-liquid forces the same up the oil-tube O to the valve-seat d, which is provided with a very small hole through which the liquid can pass when the needle n is moved out of its valve-seat. Said needle may either be made to pass down through the burner from above, as shown in Fig. 1, and in that case it is provided with a screw-thread and operated by a milled head or by a handle inserted in or attached to said head; or said needle may be made to pass up through the bottom of the reservoir A, and in that case it is operated by a screw or other suitable device from below, as shown in Fig. 3.

The oil-tube O is soldered in the abutment h, which is firmly secured by solder or other means in the neck of the reservoir A, and when once properly secured said tube is never disturbed, and it is not liable to work loose. The pump is easily screwed into the lamp air-tight and as easily kept so, there being no strain or jarring motion to loosen the same. The filler F is as easily kept air-tight by lead or cork packing put into the cap to keep them from spreading. All joints with a sliding motion through them are avoided in this lamp, and when once properly fixed they are not liable to become disturbed.

The pump P is surrounded by a case, t, of tin or other suitable material, provided with a valve, s', which opens when the plunger of the air-pump descends, or whenever the pressure of the air within the case exceeds that of the air in the reservoir A, and which closes spontaneously, or by the action of a spring, as soon as this excess of pressure ceases. This tin case is fastened to the pump-barrel by means of a screw-thread, e', and it draws out with said barrel, so that the valve s' can be readily repaired when needed. This valve may, however, be made of a simple ring of thin and elastic india-rubber, which will easily open and close, and which is not liable to wear out, or which, when it should wear or become deranged, can be readily replaced. A screw-thread, d', serves to fasten the barrel in the socket f', and holes d'' admit air into the pump-barrel whenever the plunger x' is raised above the same. A cap, c', forms the guide for the pump-rod w. On forcing the plunger down, the air contained in the lower part of the barrel is forced out through the valve y', and it passes into case t, and from it through the valve s' into the lamp.

The valve y' consists of a flat disk, the surface of which is covered with india-rubber or other suitable material, and which is held up by a spiral spring, y''.

The requisite quantity of air to support combustion is admitted to the neck of the reservoir A above the abutment h, through the aperture e, which is closed by a screw-plug or in any other suitable manner. The burner is heated by alcohol or other suitable material, which is burned in the cup $g\,g$ and a spiral, s, of loosely-coiled copper, with or without twisted copper in its center, serves

to turn the oil into gas before reaching valve-seat *d*. This spiral is suspended from a slight shoulder under the valve-seat, so that it is held open by its own weight.

My improved burner is represented in Fig. 3. It is slipped or screwed over the tube *v v*, which contains the valve-seat *d*, and fastened by the pin *r*. The tubular socket *p* of the burner is either corrugated or fluted in a longitudinal direction, (see Fig. 4,) so as to let sufficient air pass up from the neck *f f* of the reservoir to support combustion. This air mixes with the gas or vapor passing up through the oil-tube O and valve-seat *d*, and the gas mixture passes over the plate *k* and down through openings *c* and circular channel *c** to the openings *b*, when it is ignited. The channel *c** is filled with coiled copper, *o'*, and in passing through said channel, which constitutes the hottest portion of the burner, the gas is highly heated, so that it will readily burn. A cup-shaped flange, *q'*, serves to throw the flame upward. The heat of the copper coil *o'* is communicated through the fluted shank *p* to the tube *v*, so as to keep the latter hot enough to burn up all soot which accumulates therein, and also to perfectly turn the oil into gas and whiten the flame; and I must here remark that when the valve-seat *d* and tube *v* are in the lower end of the shank *p* of the burner, as shown in Fig. 1, soot accumulates and chokes up the valve-seat, whereas by my arrangement the soot is consumed and the valve-seat remains unobstructed.

In order to be able to work the needle from below the lamp, so as to make it useful, practical, and cheap, I screw the oil-tube O into the socket R' before soldering it fast to the abutment *h*. The socket R' is composed of two parts, which are separated from each other by the horizontal partition *q**. A pipe, *q''*, which is soldered to the side of the socket, conducts the oil from the reservoir A to the upper part of the socket R', and through it to the oil-tube O. The lower part of said socket forms a stuffing-box to make an air and oil tight joint around the needle *n*, and a screw, *n**, which is tapped into an arched bracket attached to the lower end of the socket R', serves to raise and lower said needle. A nut, *r**, screwed from below into the socket R', serves to tighten up the packing, so that the joint in the stuffing-box can always be held tight and in good order without disturbing any other part of the lamp.

What I claim as new, and desire to secure by Letters Patent, is—

1. The use of the needle *n*, working through the burner and from the outside of the lamp into the valve *d*, in combination with the oil-tube O, reservoir A, and air-pump P, all constructed and operating in the manner and for the purpose substantially as herein shown and described.

2. The valve *s'*, applied in combination with the case *t* and air-pump P, as specified.

3. Placing the valve-seat *d* in the top of the burner, substantially as shown in Fig. 3, for the purposes set forth.

4. The combination of the socket R' and pipe *q''* with the oil-tube O, needle *n*, valve-seat *d*, air-pump P, and reservoir A, constructed and operating in the manner and for the purpose herein specified.

J. J. RIDDLE.

Witnesses:
W. CHIASEY,
EUGENE DAYLOR.