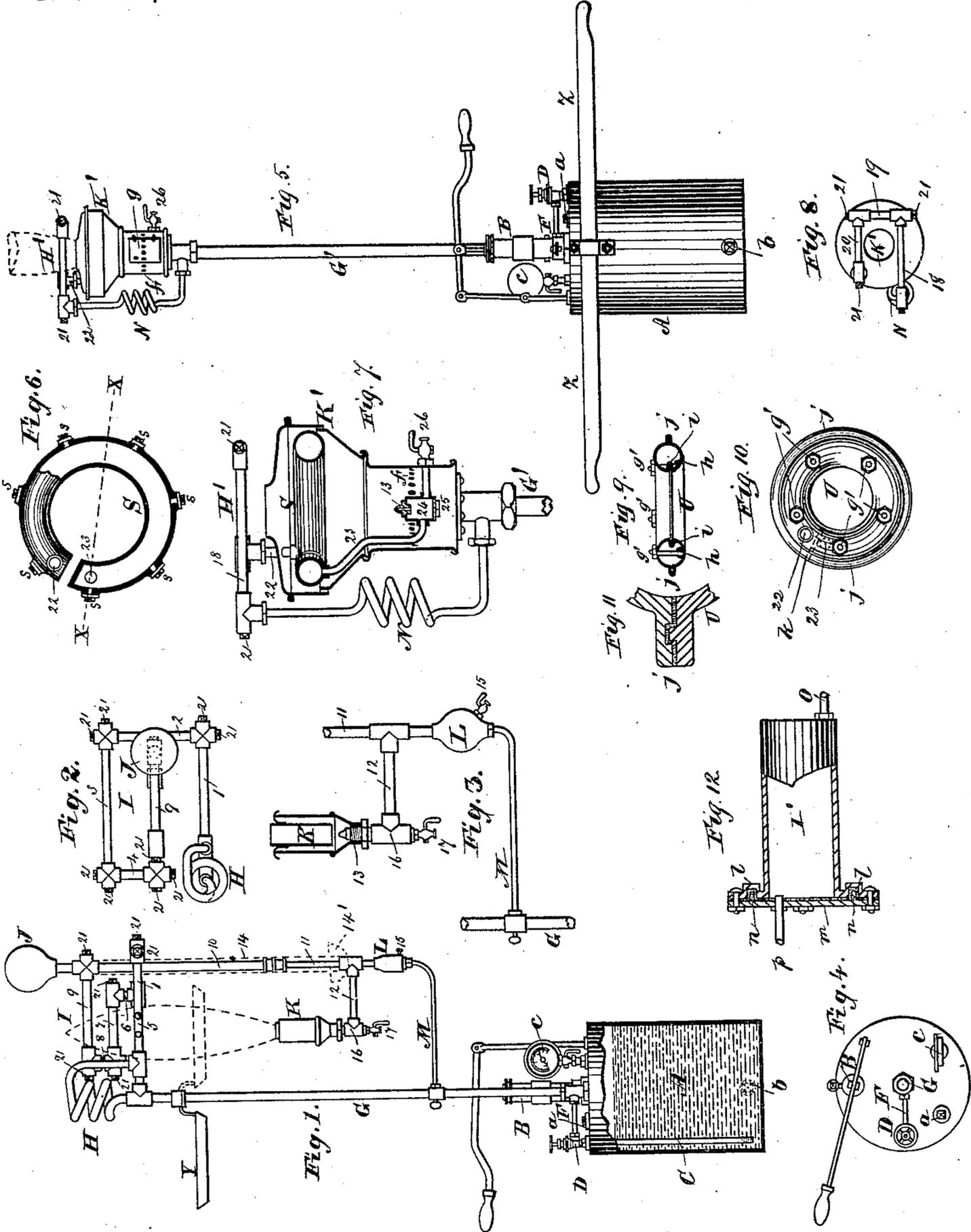


(No Model.)

G. ROSE.
LAMP.

No. 427,912.

Patented May 13, 1890.



Attest:
f. A. Hopkins
C. Arthur

Inventor:
George Rose
By *Knight Bros.*
Atty.

UNITED STATES PATENT OFFICE.

GEORGE ROSE, OF GLASGOW, COUNTY OF LANARK, SCOTLAND, ASSIGNOR OF ONE-HALF TO JAMES SINCLAIR, OF LONDON, ENGLAND.

LAMP.

SPECIFICATION forming part of Letters Patent No. 427,912, dated May 13, 1890.

Application filed March 23, 1889. Serial No. 304,413. (No model.) Patented in England March 12, 1888, No. 3,778.

To all whom it may concern:

Be it known that I, GEORGE ROSE, a subject of the Queen of Great Britain, and a resident of the city of Glasgow, Scotland, have
5 invented certain new and useful Improvements in Lamps for Burning Mineral or other Oil, of which the following is a specification.

This invention relates to improvements in the construction of lamps for burning mineral or other oil in the form of gas or vapor.
10 In lamps of this class as generally constructed the mineral or other oil to be converted into gas and then burned is contained within a closed tank or vessel, the tank forming the
15 base of the lamp. From the tank the oil is forced to ascend up a stand-pipe or tube to a vaporizing-chamber by the action of compressed air contained in or forced into the tank by a force-pump. In the vaporizing-
20 chamber the oil, by the heat of the flame of the lamp, is converted into gas or vapor, which gas or vapor is conducted from the chamber to the lamp-burner, which is so situated that the flame issuing therefrom plays
25 upon and heats said vapor-chamber.

My improvements over the lamps of this class as heretofore constructed consist in providing improved constructions and arrangement of the parts of vapor-generating chambers
30 and means for carrying off any tar or residual carbon which may accumulate in said chambers and their connections, and, further, in providing a vapor-accumulator for the purpose of keeping an even flow of vapor to the
35 burner and to thus conduce to the steadying of the flame.

In order that my said invention may be clearly understood, I have hereunto appended an explanatory sheet of drawings, whereon—

40 Figure 1 represents in elevation one form of my improved vapor-lamp. Fig. 2 is a plan view of the vapor-chamber and connections. Fig. 3 is a detail view, to a larger scale, of the combustion-box and drip arrangement, while
45 Fig. 4 is a plan view showing the oil-tank and fittings. Fig. 5 represents in elevation another form of my improved lamp. Fig. 6 is a part sectional plan, to an enlarged scale, of the superheating vapor-chamber of same; Fig. 7,
50 a part sectional elevation, to a larger scale, of

the head of the lamp, and showing the superheating vapor-chamber and casing in section on the line $x x$, Fig. 6, while Fig. 8 is a plan view of the head of the lamp. Fig. 9 is a sectional view of a modified ring construction of
55 superheating vapor-chamber and made in two halves, and Fig. 10 a plan view of the same, while Fig. 11 shows in section a joint for connecting the two halves of the chamber together. Fig. 12 is a part sectional view of another
60 form of vapor-chamber, made like a tube and having at one end a lid or door for cleaning purposes.

On the drawings the same reference-letters indicate similar or like parts wherever re-
65 peated.

Referring to Fig. 1, A is the oil-tank, which may be of any suitable construction, and which is provided with a filling-plug a and a cleaning-plug b . It is also provided with a
70 pressure-gage c for registering the air-pressure within the tank. B is a small hand-pump for forcing air into the tank; or instead of using a pump the air may be supplied to the tank from an air-compressor or by a fan or
75 otherwise. The pump B may be worked by hand, as shown. The oil to be vaporized and burned is forced from the tank A up the pipe C, which has a rose at its base, and the rose may, if desired, be protected by wire-gauze
80 for the purpose of preventing sediment entering the pipe. The oil passes from the pipe C through the branch F to the stand-pipe or tube G, a wheel-valve D being provided to regulate the oil-supply. From the tube or
85 stand-pipe G the oil passes into a coil-pipe H, preferably fitted on its upper end. This coil-pipe is for the purpose of facilitating the vaporizing process by warming the oil prior to its passing into the tubular vaporizing-
90 chamber I, to gently heat the oil, so as to melt any naphthaline crystals, and then to vaporize it later in another part of the lamp. This coil-pipe also steadies the oil-supply. This chamber I is a peculiar construction or
95 arrangement of the usual copper or other metallic vaporizing tubes or channels. As will be seen from the plan view in Fig. 2 and the elevation in Fig. 1, the tubes constituting the chamber are all arranged at right angles to
100

each other, the angles being formed by tubular cross and T pieces, which are provided with easily-removable screw-plugs 21 for cleaning. The warm oil from the coil-pipe H passes first along the tube 1, (which in Fig. 1 is partly broken away to show the tube 5 behind it,) thence along the tube 2, (see Fig. 2,) and thence successively through the tubes 3, 4, and 5. This latter tube 5 is so arranged as to be immediately over or in the center of the top of the flame. From the tube 5 the now vaporized oil passes up a vertical tube 6, Fig. 1, and then through a return-tube 7, placed above the tube 5, thence again through or up another vertical tube 8 and into the return-tube 9, placed above the tube 7. The tubes 1, 2, 3, and 4 surround the flame and provide a heating-chamber, while the tubes 5, 7, and 9, passing through the flame, provide a superheating-chamber. From the tube 9 the vapor ascends into an accumulator J, preferably fitted on top of the cross-piece forming the angle between the tubes 9 and 10, and which is of hollow spherical form, as shown, although it might be of cylindrical or other equivalent shape. This accumulator is provided for the purpose of maintaining a steady flow of vapor to the lamp-flame and so to conduce to the steadying of the light. Without this accumulator, should the flame, from the action of the wind or other cause, not act directly upon the tubular vaporizing-chamber I, the vapor thrown off will diminish and cause the flame to be proportionately lowered until the flame is again brought to play directly on the vaporizing-tubes, when by the increased heat sufficient vapor would be thrown off to keep the flame at its normal height. With the accumulator during such periods of lessened vaporization vapor would be supplied from it to the burner and so tend to keep the flame steady. From the accumulator the vapor descends in the pendent pipe 10 on the opposite side of the lamp to the stand-pipe, which has or may have a reducing tube 11 fitted into it, and then by the pipe 12 to the burner 13. (See Fig. 3.) The burner 13 is likewise fitted on top of the combustion-box K, (shown in Fig. 1) which consists of two concentrically arranged tubes, the inner tube being of

For the purpose of carrying off any drip—that is, any tar or residual carbon—which may accumulate in the tubes or pipes, I provide a “drip” tube or chamber L, which may be in the form of an enlarged tube, as shown at Fig. 1, or it may be a hollow ball, as shown at Fig. 3, or it may be of any other equivalent shape. This drip tube or chamber is shown as screwed by a short pipe-connection into the under side of the T-piece forming the junction between the tubes 11 and 12. The drip arrangement would in all cases be preferably supplied with a small tap or cock 15 (or a screw-plug may be used) for the purpose of drawing off the residual or liquid tar. The T-piece 16, forming the support for the burner 13 and combustion-box K is shown as being used as an auxiliary drip, a small cock 17 being screwed into its under side, by which the tar or residual can be drawn off.

To relieve the strain on the vaporizing-chamber I and to keep the parts steady when the lamp is being moved, I provide an adjustable bracket M, capable of sliding and being clamped in any desired position on the stand-pipe or tube G. The arm of this bracket fits into the under side of the drip-tube L.

With the improved rectangular form of vaporizing-chamber I, hereinbefore described, it will be seen that the warm oil from the coil-pipe H is made to flow first round about the flame, and in so going round always getting more highly heated until by the tubes 5, 6, 7, 8, and 9 it is carried back and forth through or over the flame itself, and thus becomes thoroughly vaporized. By having the tubes 5, 7, and 9 above each other, with the vertical connections 6 and 8 between them, a defect very common in vapor-lamps as heretofore constructed—namely, that of flooding the lamp from turning on too much oil or from the tubes becoming chilled—is minimized or entirely done away with, as the oil must first fill up the horizontal tubes and then pass through the small outlet in the highly-heated vertical connections. By simply arranging tubes in a horizontal plane and one beside the other, as has sometimes heretofore been done, it will be readily understood that the lamp could be flooded with the tubes but half full or even less.

My improved arrangement has a further advantage in being very easily cleaned of carbon, as cleaning-plugs 21 or doors or other devices can be arranged at each angle for this purpose.

In the modified arrangement of lamp shown in Figs. 5, 6, 7, and 8, instead of making the vaporizing-chamber I of a number of tubes placed in rectangular formation, I vaporize the oil in a superheater consisting of a coil or chamber which is cast or bent into a shape that the two ends nearly meet and are held together by a fitting ring. The oil forced up by the branch pipe 11 with one or more of the heating-tubes

heating-tube, the branch pipe, the burner, and the combustion-box, substantially as described.
 2. The vaporizing-chamber consisting of the tubes 1, 2, 3, and 4, extending around the flame, and the tubes 5 and 7, extending vertically as described. The vaporizing-chamber 5, 6, 7, 8, 9, extending across the flame, and the tubes 10 and 11, connecting the tubes 9 and 13 respectively.

oil-supply, and then into the oil warming or heating arrangement H', which is made preferably of three tubes 18, 19, and 20, (see Fig. 8,) joined together at their angles by T cross or knee pieces. In the case of T or cross pieces being used cleaning-plugs 21 are also used. In these tubes the oil gets highly heated and partly vaporized. From the tube 20 the partly-vaporized oil descends by the vertical pipe 22, Figs. 5 and 7, into the upper side (or it may be the under side) of the split-ring chamber or coil S. The ends of this chamber S are cast solid or plugged up, so that the oil entering at the inlet 22 has to pass completely round it before escaping by the outlet-pipe 23, and so to the burner 13. Round the circumference of the chamber S screw-plugs *s* are provided for cleaning out carbon.

The split-ring construction of chamber S while being simple is also effective, for it insures a thorough vaporization of the oil, from its having to pass round the full circuit of the ring or coil before reaching the outlet. This construction also allows for expansion under great heat. With this arrangement of lamp I prefer to make the drip-tube as a hollow chamber 24, constituting the base of the burner 13. This chamber 24 may be provided with a screw-plug 25 for cleaning purposes, and a cock 26 for blowing off tar or residual. The combustion box or casing K' is supported on top of the stand-pipe G', and is so made as to surround and inclose the burner and vapor-chamber, and to thus protect them from the chilling effect of the atmosphere. A number of holes *f* are made, preferably round the lower part, to admit air to support combustion, and if required a small hinged or other door *g* may be fitted on it to allow of the burner being cleaned.

Figs. 9, 10, 11, and 12 represent tubular box or ring constructions of vapor-chamber, with easily-removable lids for cleaning purposes.

Figs. 9, 10, and 11 show a box-chamber U, made in two halves or parts, the upper part being easily removable and constituting the lid. The parts are secured together by bolts or studs *g'*. These bolts or studs I prefer to secure at their lower ends in sockets or snugs *h*, cast on the under half of the chamber, although they may pass right through the chamber and they may have screw-nuts at both ends. To make a tight joint between the halves of the chamber, flanges *i* and *j* are cast or formed on the halves of the ring. The flanges *i*, I prefer to make in the inside of the ring, as shown, as they do not then split or impede the passage of the flame, and the flanges *j* may be on the outside, or both jointing-flanges *i* and *j* may be made on the inside, or both on the inside and outside. The flanges of the upper half or lid are preferably made with a groove in them, (see Fig. 11,) and into this groove fits a circular rib or projection formed on the flanges of the lower half. The

joint is made tight by asbestos or other packing.

In order that the oil may circulate around the ring, a partition or piece K (shown in dotted lines at Fig. 10) is or may be cast or formed in the inside of the ring-box. The oil enters the ring at the inlet 22, and passes out in the form of vapor at the outlet 23 (indicated in dotted lines) and so to the burner.

When the two parts of the chamber U are unbolted, by unscrewing the nuts the carbon which may have been deposited in the inside can be easily cleaned out.

Fig. 12 shows another form of box-chamber I', which may be used in lieu of the rectangular construction of chamber I, hereinbefore described with reference to Figs. 1 and 2. This chamber consists of a single tube plugged or cast solid at one end, the other end being formed with a flange *l* around it. To this flange a lid or door *m* is bolted or screwed in a removable manner, so as to enable the chamber to be cleaned out. The lid has preferably a circular ridge *n* on it which fits into a corresponding groove in the flange *l*, the joint being made tight by asbestos or other packing. The oil-inlet is shown at *o* and the vapor-outlet at *p*.

Instead of using a single split-ring chamber S, as shown, two or more may be used, and, if desired, the warming-tubes H', Fig. 8, may be replaced by a ring-box or a split-ring chamber, and instead of having two vertical connections 6 and 8, as shown at Fig. 1, for the chamber I, one or more may be used.

Handles Z, arranged one on each side of the tank, may be provided for the easy removal of the lamp from place to place, as desired.

To start the lamp, naphtha or other oil-saturated waste, or oil only, is put or poured into the initial heating-cup Y, Fig. 1, and the cup turned into the position shown in dotted lines, or into the combustion-box K', Fig. 5, which on being ignited would raise sufficient heat to vaporize the oil in the vapor-chamber.

Although I have only shown the vapor-accumulator J as used with the lamp at Fig. 1, it may also be used on top of the lamp at Fig. 5.

The bolts *g'* (shown at Fig. 9) would preferably be iron ones with brass nuts.

My improved lamp may be used for heating as well as lighting purposes, and where it would be desired so to use the lamp the flame would preferably be directed horizontally into the furnace or chamber to be heated.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A lamp comprising a tank, a stand-pipe, heating-tubes surrounding the flame, a coil-pipe connecting the tubes with the stand-pipe, a superheating-tube connected with the heating-tubes and exposed to the action of the flame, a pipe depending from the super-

heating-tube, the branch pipe, the burner, and the combustion-box, substantially as described.

2. The vaporizing-chamber consisting of the tubes 1, 2, 3, and 4, extending around the flame, and the tubes 5 and 7, extending across the flame, having vertical connection 6, substantially as described.

3. The vaporizing-chamber consisting of the tubes 1, 2, 3, and 4, extending around the flame, the tubes 5, 7, and 9, extending across the flame, and the vertical connecting-tubes 6 and 8, substantially as described.

4. The combination of the coil-pipe and the vaporizing-chamber, consisting of the tubes 1, 2, 3, and 4, extending around the flame, and the tubes 5 and 7, extending across the flame, having vertical connection 6, substantially as described.

5. The combination of the vaporizing-chamber consisting of the tubes 1, 2, 3, and 4, extending around the flame, the tubes 5, 7, and

9, extending across the flame, the vertical connecting-tubes 6 and 8, and the accumulator secured to the pipe 9, substantially as described.

6. A lamp comprising a tank, a stand-pipe, a coil-pipe connected to the stand-pipe, the tubes 1, 2, 3, and 4, connected to the coil-pipe and extending around the flame, the tubes 5, 7, and 9, extending across the flame, the pendant pipe 10, the branch pipe 12, the burner 13, and the combustion-box K, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 4th day of February, 1889.

GEORGE ROSE.

Witnesses:

HUGH FITZPATRICK,

Patent Agent, 70 Wellington St., Glasgow.

WILLIAM FLEMING,

Draughtsman, 70 Wellington St., Glasgow.