

No. 621,966.

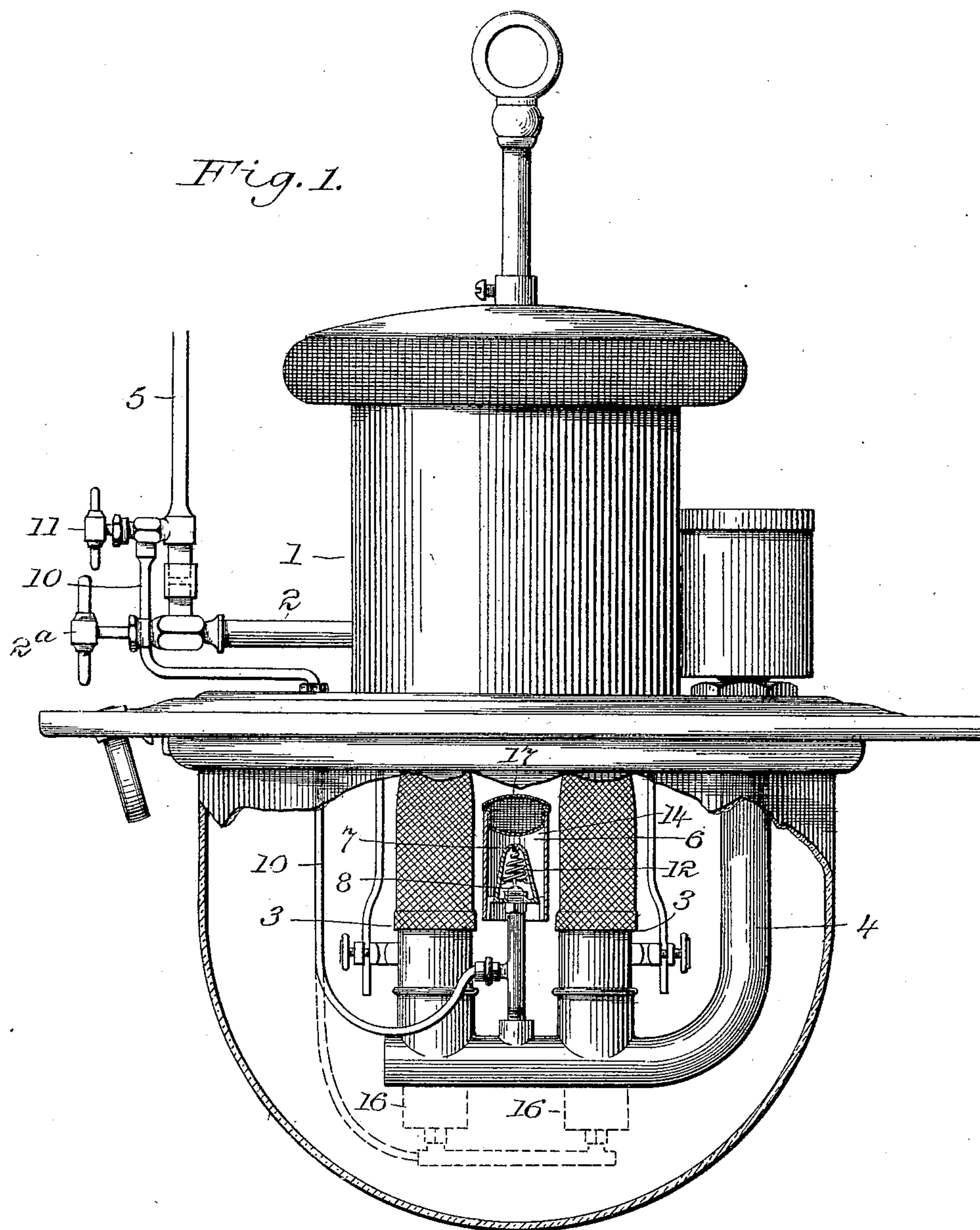
Patented Mar. 28, 1899.

A. KITSON.
VAPOR BURNING APPARATUS.

(Application filed Nov. 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Ernest W. Clark

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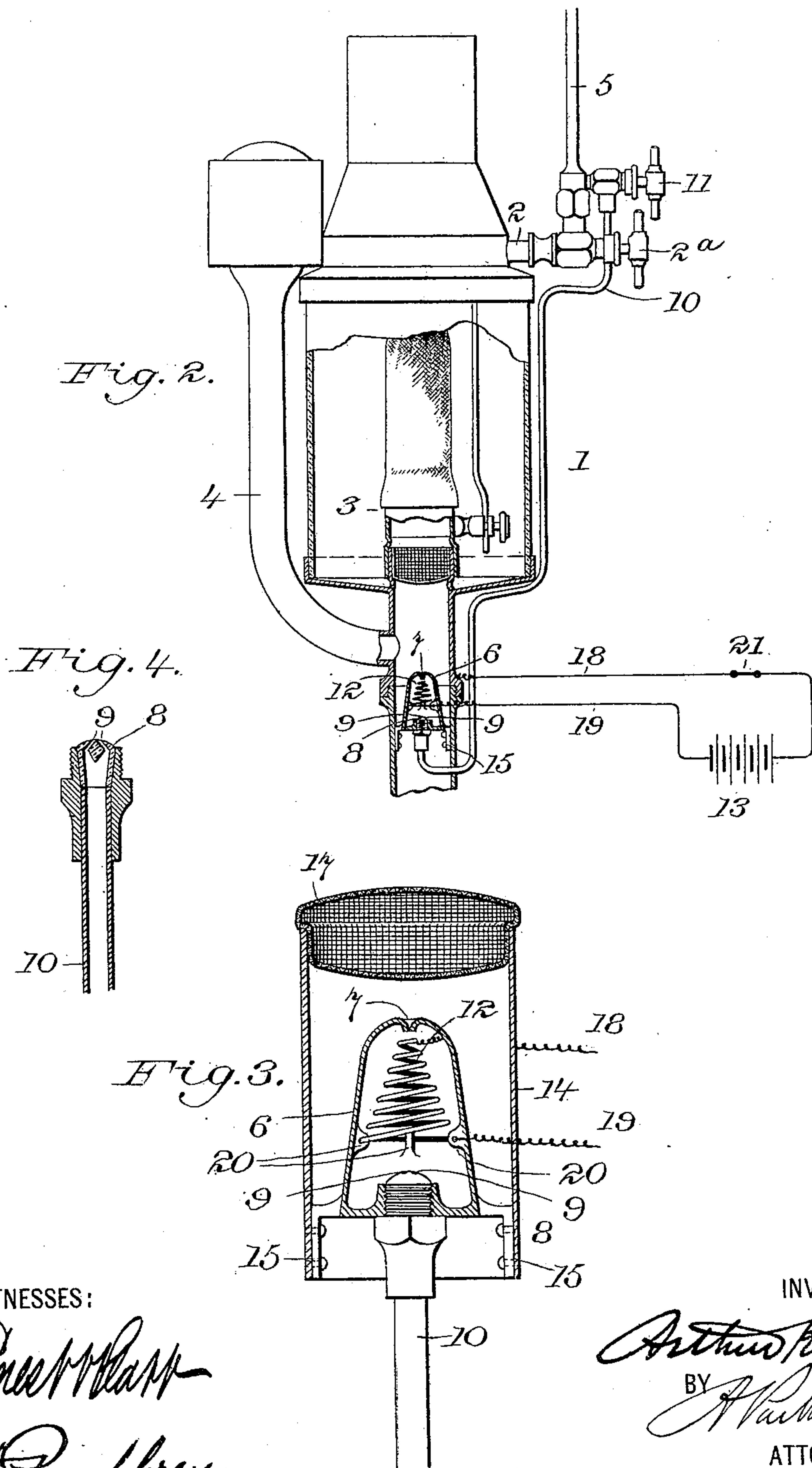
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2 Sheets—Sheet 2.



WITNESSES:

James H. Hart
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INVENTOR

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UNITED STATES PATENT OFFICE.

ARTHUR KITSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
KITSON HYDROCARBON HEATING AND INCANDESCENT LIGHTING COM-
PANY, OF SAME PLACE AND CHARLESTON, WEST VIRGINIA.

VAPOR-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 621,966, dated March 28, 1899.

Application filed November 5, 1898. Serial No. 695,589. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KITSON, a sub-
ject of the Queen of Great Britain, and a resi-
dent of Philadelphia, county of Philadelphia,
5 State of Pennsylvania, have invented certain
new and useful Improvements in Vapor-Burn-
ing Apparatus, of which the following is a
specification.

My invention relates to vapor-burning ap-
10 paratus, and is especially designed to produce
a simple and effective apparatus for produc-
ing the initial heating necessary to start said
apparatus into action. In all forms of such
apparatus that I have heretofore designed—
15 such, for instance, as that illustrated in my
United States Patent No. 600,792, dated March
15, 1898—the action is self-sustaining after
once put in operation by reason of the fact
that the heat given off by the burner is em-
20 ployed in part to heat the vaporizing-tube,
and thus transform fluid hydrocarbon into
vapor; but in order to produce the initial
heating of said tube some extraneous source
of heat is necessary. To accomplish this in
25 a safe and convenient manner, I propose to
employ an auxiliary electrical heater.

The apparatus herein illustrated and de-
scribed is a modification of that shown in my
Patent No. 613,685, dated November 8, 1898,
30 and also an improvement on that shown in my
pending application, Serial No. 681,594, filed
May 24, 1898. The employment of the entire
vaporizing-tube as a heating-conductor, as
shown in said patent, requires a large amount
35 of current. The locating of the electrical
vaporizing apparatus in the vaporizing-tube
itself, as shown in my application, Serial No.
681,594, interferes with the introduction of
the improved form of vaporizing-tube filler,
40 which I have found desirable, one form of
which is illustrated and described in my pend-
ing application, Serial No. 689,657, filed Au-
gust 27, 1898. To avoid both these difficul-
ties, I propose to locate the electrical heating-
45 coil in a second and separate vaporizing-cham-
ber, which shall have a suitable discharge-
orifice for discharging a jet of the vapor
formed therein, and to locate said second vap-
orizing-chamber below the vaporizing-tube,

so that the issuing jet when ignited will heat 50
said vaporizing-tube to the necessary tem-
perature to start the lamp.

The preferred form of apparatus for carry-
ing out my invention is illustrated in the
accompanying two sheets of drawings, in 55
which—

Figure 1 is a side view, partly broken away
and partly in section, showing my invention
applied to what is known as a "cluster" lamp.
Fig. 2 is a similar view showing my invention 60
applied to a single-mantle lamp, the vapo-
rizer being located in the lower part of the
lamp-burner. Fig. 3 is an enlarged detail
view of the vaporizer, shown in section. Fig.
4 is an enlarged detail showing the spraying- 65
nozzle in cross-section.

Throughout the drawings like reference-
figures refer to like parts.

1 represents a vapor-burning lamp of any
one of the general types illustrated and de- 70
scribed in my patent, and applications above
referred to.

2 is the vaporizing-tube, and 3 is the vapor-
burner, within the heating-zone of which the
vaporizing-tube 2 is located. 75

4 is a mixing-tube supplying a mixture of
vapor and air to the burner, and 5 is the oil-
supply pipe.

6 represents the second vaporizing-cham-
ber, which has the discharge-orifice 7 and an 80
inlet in the shape of a spraying-nozzle 8. This
spraying-nozzle may be of any desired form;
but I have illustrated one having the two op-
posing discharge-orifices 9 9, so that the two
jets of oil are opposed to one another and pro- 85
duce a spraying action somewhat similar to
that of the old-fashioned fish-tail gas-burner.

10 is a branch oil-supply pipe controlled by
the valve 11 and leading from the main sup-
ply-pipe 5 to the spraying-nozzle 8. 90

12 represents a high-resistance electrical
conductor, preferably arranged in the shape
of a conical coil, as shown.

13 represents a battery or any other source
of electric-current supply, from which cur- 95
rent flows through the conductors 18 19 to
the two ends of the coil 12. As a convenient
arrangement I have shown one end of the coil

attached to the metal-work of the lamp, so that one of the lead-wires, as 18, should be connected to the metal-work of the lamp, or the same may be grounded, in which case the
5 corresponding pole of the battery will be grounded.

14 is any convenient form of air-mixing device, consisting, as shown, of a cylindrical hood surrounding the vaporizing-chamber and
10 within which hood the said vaporizing-chamber is supported by spider-arms 15 15, &c.

17 represents a reticulated diaphragm, of wire-gauze or similar material, located across the air-mixing device and in the path of the
15 mixed air and vapor, which will be driven along by the jet of vapor issuing from the discharge-orifice 7. The lower end of the electrical coil is insulated from the metal parts of the apparatus by being mounted in
20 non-conducting lugs 20 20, &c.

In Fig. 1 I have shown the electrical lighter or second vaporizing-chamber, with its accessories, mounted between two mantles of the double burner. In Fig. 2 it is shown located
25 in the lower part of the main burner 3, in which case the gauze diaphragms of said burner take the place of the special reticulated diaphragm 17.

21 represents any form of electrical switch for opening and closing the circuit from the electrical source of supply to the heating-coil. The electrical vaporizer may be inserted beneath the burners in the construction shown in Fig. 1, as indicated at 16 16 in dotted lines
30 in said figure. In this case the necessary air is supplied through the mixing-tube, as is the case in the construction shown in Fig. 2.

The method of operating my invention is as follows: The switch 21 being closed, the
40 coil 12 becomes heated to a red or white heat. The valve 11 being opened, oil is sprayed on said coil by the spraying-nozzle 8 and immediately vaporized. The vapor issues under pressure through the discharge-orifice 7, forming a
45 jet which entrains a quantity of air up through the air-mixing hood 14. The mixture passes through the reticulated diaphragm 17 and is then ignited by a match or other convenient means. The blue flame thus created heats
50 the vaporizing-tube 2. When the vaporizing-tube has been raised to the necessary temperature, the valve 2^a in the main supply-pipe is opened, admitting oil to the vaporizing-tube 2, where it is vaporized, and the operation of the lamp then becomes self-supporting in the well-understood manner. The valve
55 11 is then closed and the switch 21 opened until it again becomes necessary to light the lamp. In the arrangement shown in Fig. 2 the method of operation is the same, except that the jet from the vaporizing-chamber 6 draws in the necessary air through the mixing-tube 4 and the mixture is discharged through and burned at the main burner 3.

65 The advantages of the invention are of course the doing away with the necessity of

using alcohol or other volatile fluid for starting the lamp or the attachment to a gas-fixture, which is sometimes employed for this purpose. At the same time the attachment
70 does not interfere with the regular working of the lamp, and in the construction shown in Fig. 2 and in dotted lines in Fig. 1 it fits into the lamp itself and is completely hidden.

Various changes could be made in the details of the apparatus disclosed without departing from the spirit and scope of my invention, so long as the general arrangement of parts shown in the drawings and the general principle of operation set out in the specification are retained. Other forms of vaporizing-chamber and heating-coil could be employed, and the coil might be mounted in the vaporizing-chamber in a different manner. The electrical connections shown are merely
85 illustrative, and other ways of bringing the current into the heating-coil might be substituted in practice. The particular form of spraying-nozzle might be changed and the location of the electrical vaporizing apparatus
90 varied, so long as it is kept below the vaporizing-tube, so that the heat generated by igniting the vaporized oil will heat said tube.

Having therefore described my invention, what I claim as new, and desire to protect by
95 Letters Patent, is—

1. In a vapor-burning apparatus the combination of a vaporizing-chamber, an electrically-heated conductor in said chamber, and a spraying-nozzle for delivering oil into
100 said chamber, substantially as described.

2. In a vapor-burning apparatus the combination of a vaporizing-chamber, an electrical heating-coil in said chamber, and a spraying-nozzle arranged to spray the oil on
105 the coil, substantially as described.

3. The combination with a vapor-burning apparatus having a vaporizing-tube located within the heating zone of the burner, of a second vaporizing-chamber having a restricted
110 discharge-orifice, and electrical means for vaporizing the oil in said second chamber, said second chamber being located beneath the vaporizing-tube, substantially as described.

4. The combination with a vapor-burning apparatus having a vaporizing-tube located within the heating zone of the burner, of a second vaporizing-chamber having a restricted
115 discharge-orifice, and electrical means for vaporizing the oil in said second chamber, said second chamber being located beneath the vaporizing-tube, together with an air-mixing device arranged in operative relation to said discharge-orifice, substantially as described.
125

5. The combination with a vapor-burning apparatus having a vaporizing-tube located within the heating zone of the burner, of a second vaporizing-chamber having a restricted
130 discharge-orifice, and electrical means for vaporizing the oil in said second chamber, said second chamber being located beneath

the vaporizing-tube, together with the oil-supply pipe connected to the vaporizing-tube, a branch pipe leading to the second vaporizing-chamber, and a valve controlling said branch pipe, substantially as described.

6. The combination with a vapor-burning apparatus having a vaporizing-tube located within the heating zone of the burner, of a second vaporizing-chamber having a restricted discharge-orifice, and electrical means for vaporizing the oil in said second chamber, said second chamber being located beneath the vaporizing-tube, in the lower part of the burner, substantially as described.

7. In a vapor-burning apparatus the combination of a vaporizing-chamber, an electrical heating-coil in said chamber, and a spraying-nozzle having two opposing dis-

charge-orifices arranged to spray the oil on the coil, substantially as described.

8. In a vapor-burning apparatus the combination of a vaporizing-chamber provided with inlet and outlet openings, an electrically-heated conductor in said chamber, and an air-mixing device arranged in operative relation to the outlet of the vaporizing-chamber, together with a reticulated diaphragm located in the path of the mixed air and vapor, substantially as described.

Signed by me, at New York city, this 19th day of October, 1898.

ARTHUR KITSON.

Witnesses:

LILIAN FOSTER,
ERNEST V. PRATT.