

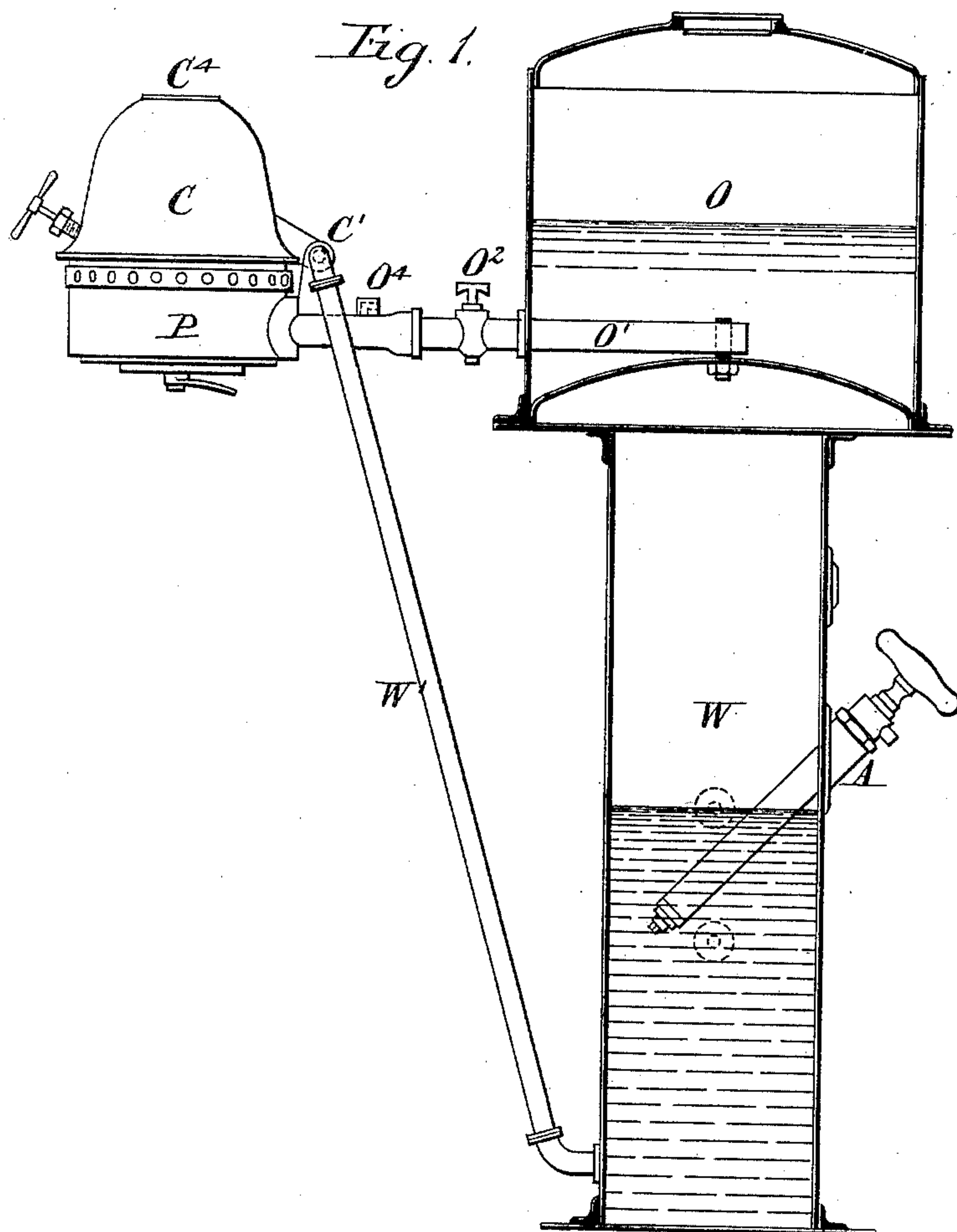
(No Model.)

2 Sheets—Sheet 1.

G. S. GRIMSTON.
VAPOR BURNER.

No. 407,198.

Patented July 16, 1889.



Witnesses:
J. A. Rutherford.
Dennis Sundry.

Inventor:
George S. Grimston.
By James L. Norris.
Attorney.

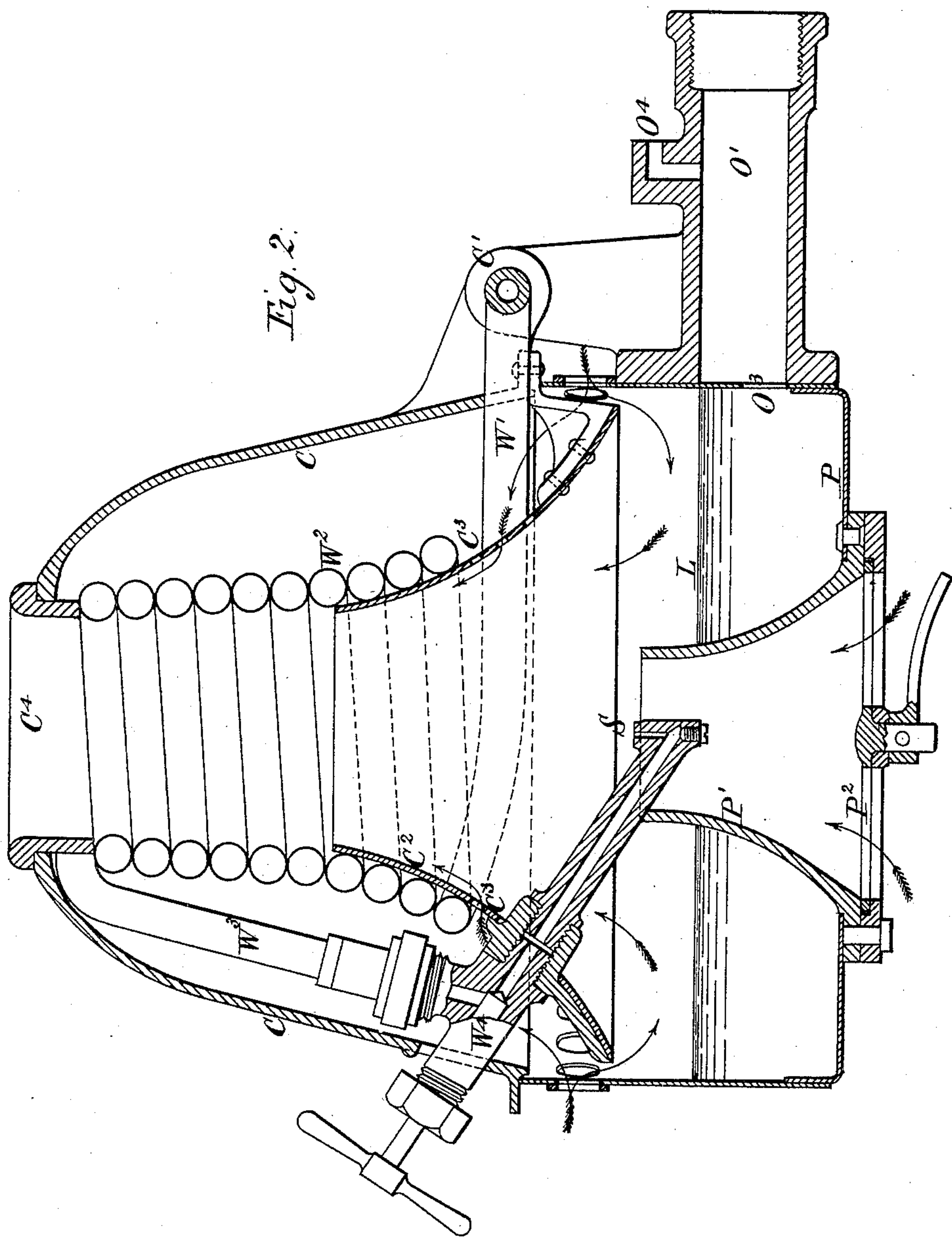
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G. S. GRIMSTON.
VAPOR BURNER.

No. 407,198

Patented July 16, 1889.



Witnesses:
J. A. Rutherford
Dennis Sumby

Inventor:
George S. Grimston
By James L. Norris
Attorney

UNITED STATES PATENT OFFICE.

GEORGE S. GRIMSTON, OF GREENWICH, COUNTY OF KENT, ASSIGNOR TO
THE LUCIGEN LIGHT COMPANY, (LIMITED,) OF WESTMINSTER, ENGLAND.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 407,198, dated July 16, 1889.

Application filed April 9, 1889. Serial No. 306,558. (No model.) Patented in England November 16, 1888, No. 16,636; in France March 30, 1889, No. 197,104, and in Belgium March 30, 1889, No. 85,619.

To all whom it may concern:

Be it known that I, GEORGE SYLVESTER GRIMSTON, a citizen of England, residing at Claremont, Glenluce Road, Greenwich, in the
5 county of Kent, England, have invented a new and useful Improvement in Vapor-Burners, (for which I have applied for a patent in Great Britain, which patent when granted will bear date November 16, 1888, No. 16,636,
10 and have obtained patents in France dated March 30, 1889, No. 197,104, and in Belgium dated March 30, 1889, No. 85,619,) of which the following is a specification.

This invention has for its object the improvement of that class of vapor-burners in which steam is combined with air and oil-vapor.

In this apparatus the oil is supplied to a burner, which consists of the following parts:
20 a pan for receiving the oil. Above this is a cover of conical form, which radiates heat on the oil and leads the vapor thus produced from the oil into a suitable nozzle. In the cover there are openings admitting air, which
25 becomes heated in its passage through them.

For feeding the pan of the burner with oil, I employ a tank or reservoir having a passage from its bottom to the pan, which is on the same level. The tank being hermetically
30 closed, only a small quantity of oil flows from it into the pan, when the level of the oil in the pan falls below the mouth of the passage, allowing a small quantity of air to enter the tank.

35 In order to induce a current of air for forming an elongated flame of the burning oil, I surround the lower portion of the flame by a pipe-coil, one end of which is preferably connected to a tank containing water under pressure, and the other end terminates in an injector-jet in the middle of an air-passage in the center of the burner-pan.

Steam generated in the coil issues through the jet and draws in a current of air, and thus
45 a mixed current of air, steam, and oil-vapor is directed through the nozzle of the burner, producing an elongated flame.

The water-pressure may be obtained by forcing air by means of a small hand-pump
50 into the water-tank.

Instead of employing a water-tank, as above described, the coil can be connected to the ordinary water-supply, or where steam is available the coil can be directly supplied with it.

Figure 1 of the accompanying drawings is a vertical section of the water-tank and oil-reservoir, with elevation of the burner connected therewith; and Fig. 2 is an enlarged vertical section of the burner.

P is the pan of the burner, through the bottom of which is a passage P' for air, governed by a rotating valve P². The passage P' terminates above the level L of the oil in the pan. This level is determined in the following manner:

From the bottom of the oil-tank O a passage O', provided with a stop-cock O², leads to the pan P; but only the lower part of the mouth of this passage is open, as indicated at
70 O³. When the level L of the oil in the pan falls below that in the passage O', air can enter by a port O⁴ and find its way into the reservoir O, allowing the flow of a small quantity of oil to the pan. The pan is provided
75 with a cover C, which is hinged at C', the hinge forming a trunnion with a packed joint for a pipe W', that ascends from the bottom of the water-tank W. The pipe W' is continued to form convolutions W² of the pipe-
80 coil in which steam is generated, and from the top of the coil a pipe W³, governed by a screw-stop valve W⁴, descends to the steam-jet S.

Within the coil W² is a casing C² of conoidal form perforated with holes C³ all round it under the coil. At the top of the cover C is the flame-orifice C⁴. In the side of the water-tank W is fixed a hand-pump A, for compressing air, which occupies the upper part of
90 the tank, giving pressure sufficient to force the water up to and through the coil W². When a supply of water under pressure is available, the tank W and hand-pump A may be dispensed with, the pipe W' being connected simply to the water-main. The steam
95 generated in the coil W², issuing in a jet at S, induces a current of air through the passage P', and also a current of oil-vapor from the surface L. The mixed current of air, 100

steam, and oil-vapor being ignited forms a powerful flame, having additional air supplied to it through the perforations C³. The lower part of the flame heats the casing C² and the coil W².

Heat radiated from the casing C² on the oil at L maintains the supply of oil-vapor. The air entering at C³ is also heated, and steam is generated in the coil W², and after the burner has been a short time in action a powerful elongated flame issues at C⁴, available for lighting or heating purposes. The cover C, along with the casing C², coil W², and pipe W³, and jet S, can at any time be turned over on the hinge C' to give access to the interior of the pan and casing.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. In a vapor-burner, the combination of a closed oil-reservoir, a burner having a central air-opening in its bottom and supported on a level with the oil-reservoir, a hinged burner-cover having a flame-orifice at the top and containing a perforated inner conoidal casing also terminating at top in a flame-orifice, a steam-coil located in said cover and having at its lower end a steam-jet that projects upward in the center of the burner, a valve for controlling the steam-jet, and a pipe leading from the lower part of the oil-reservoir to the lower part of the burner and provided at its top with an air-inlet to the oil-reservoir, substantially as described.

2. In a vapor-burner, the combination of a closed oil-reservoir, a burner having in its bottom a central air-passage controlled by a valve, a pipe leading from the lower part of the oil-reservoir to the lower part of the burner and communicating therewith only

at the lower part of said pipe, which is provided in its upper part with an air-inlet to the oil-reservoir, a hinged burner-cover having a flame-orifice in its top, an inner perforated conoidal casing supported by the cover and also having a flame-orifice in its top, a steam-coil supported in the cover and having at its lower end a steam-jet that projects upward in the center of the burner, a valve for controlling the steam-jet, and a pipe communicating with the steam-coil through the hinge-joint of the burner-cover, substantially as described.

3. In a vapor-burner, the combination of a closed oil-receptacle, a burner on a level with said reservoir, a pipe leading from the lower part of the reservoir to the lower part of the lamp and having an air-inlet to the reservoir, a hinged burner-cover having a flame-orifice, a perforated and open top inner casing, a steam-generating coil supported in the cover and having at its lower end a steam-jet that projects upward in the center of the burner, a water-tank having a pipe communicating with the steam-coil through the hinge-joint of the cover, and a pump connected to the water-tank, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 22d day of March, A. D. 1889.

GEO. S. GRIMSTON.

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