(No Model.) 2 Sheets—Sheet 1.

J. W. WEEKS.

OIL GAS BURNING APPARATUS.

No. 545,325. Patented Aug. 27, 1895.

Fig 1.

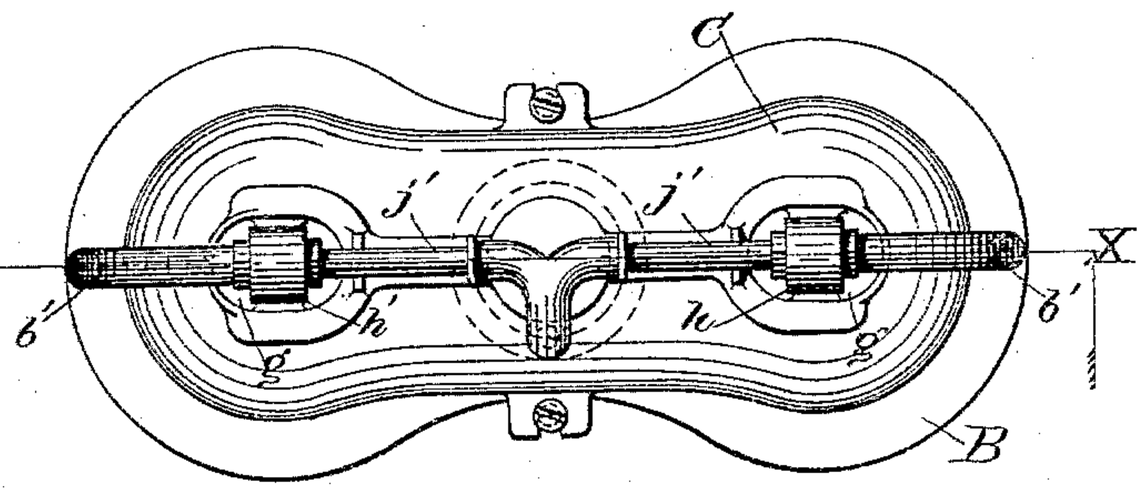
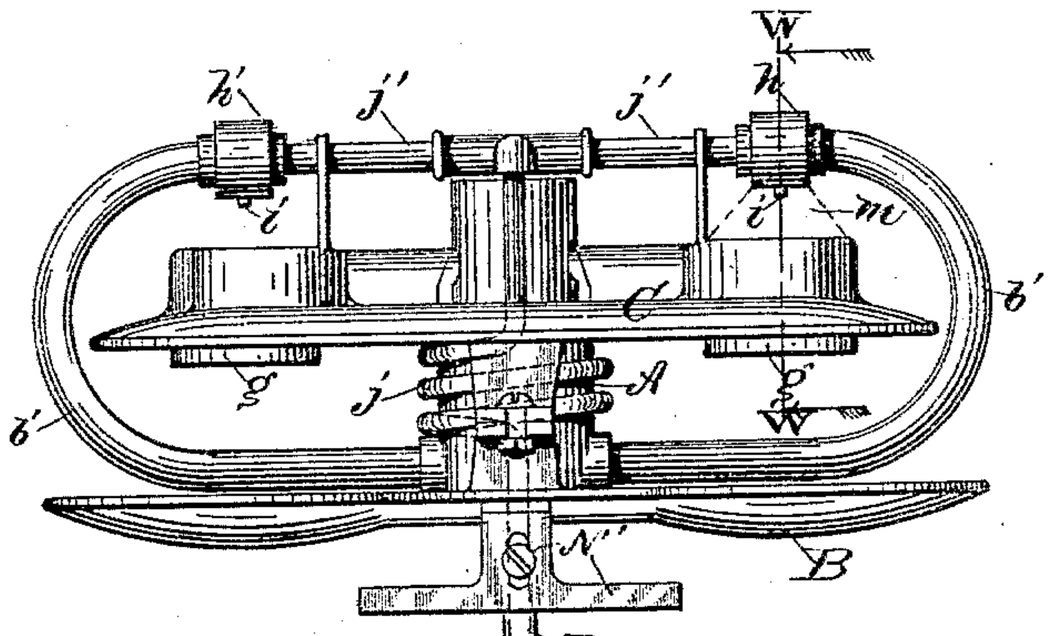


Fig 2.



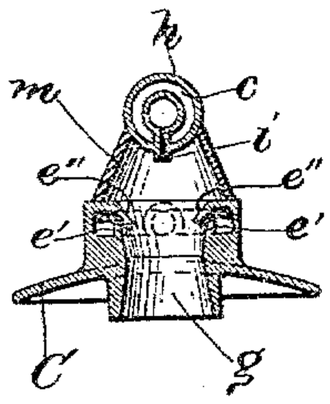


Fig 9.

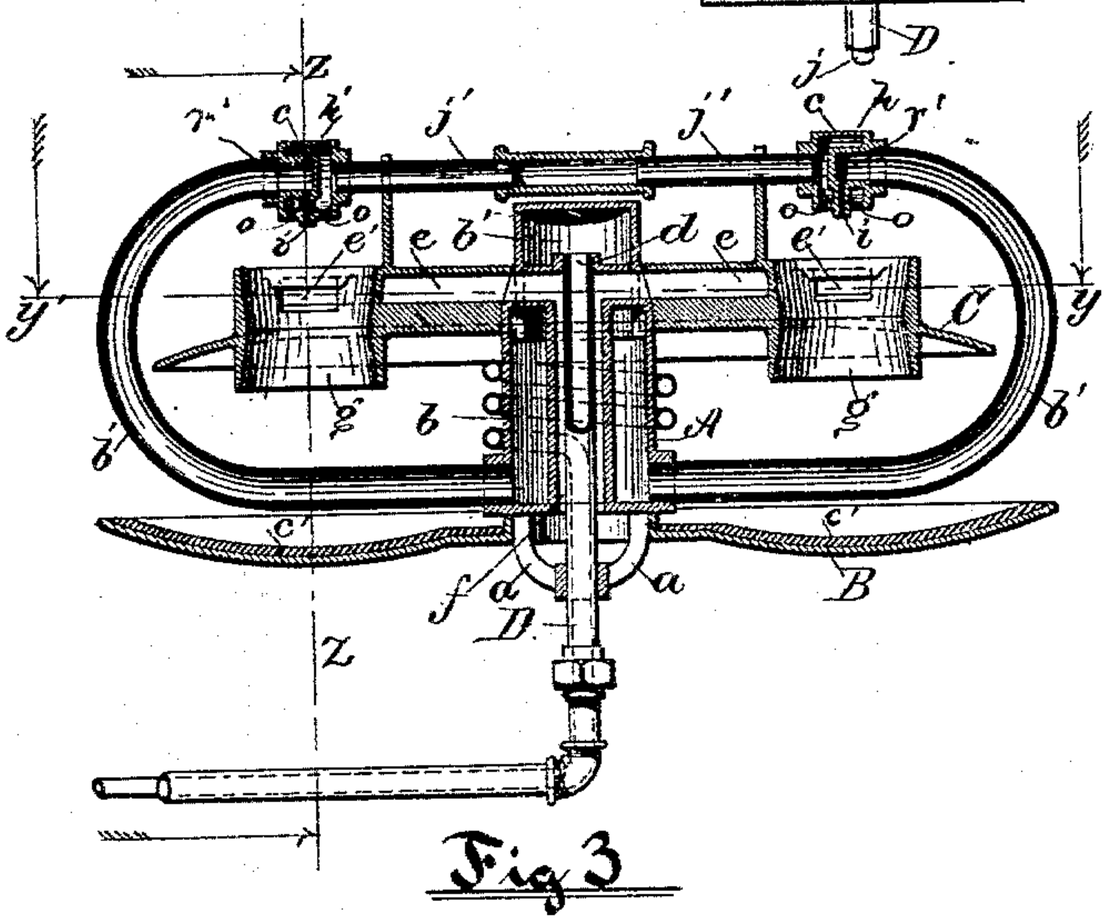


Fig 3

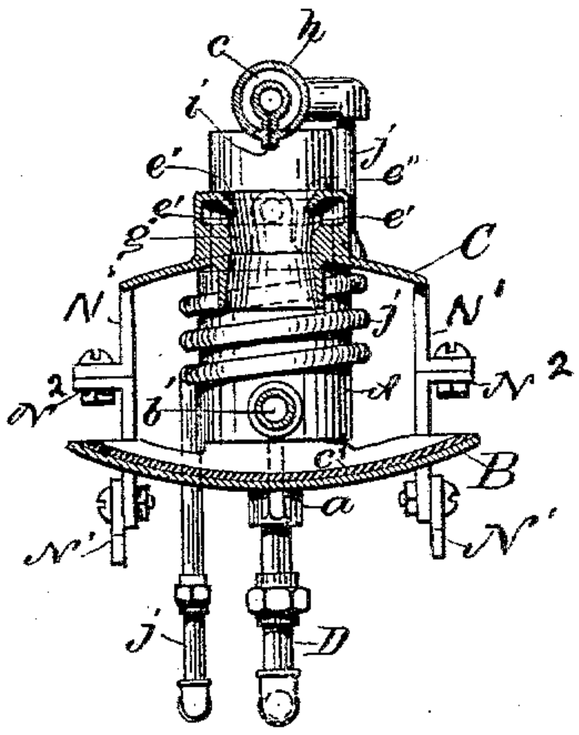


Fig 4

Witnesses

Willard A. Smith.

James P. Bucklin.

Inventor.

John W. Weeks.

By Benj. Arnold

Attorney.

(No Model.) 2 Sheets—Sheet 2.

J. W. WEEKS.

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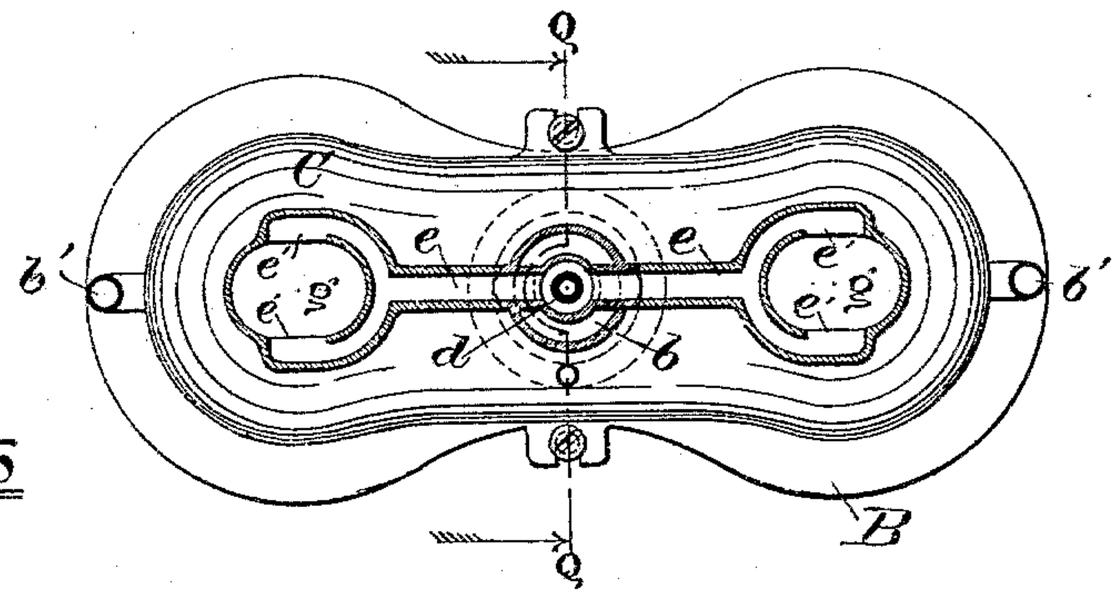


Fig 5

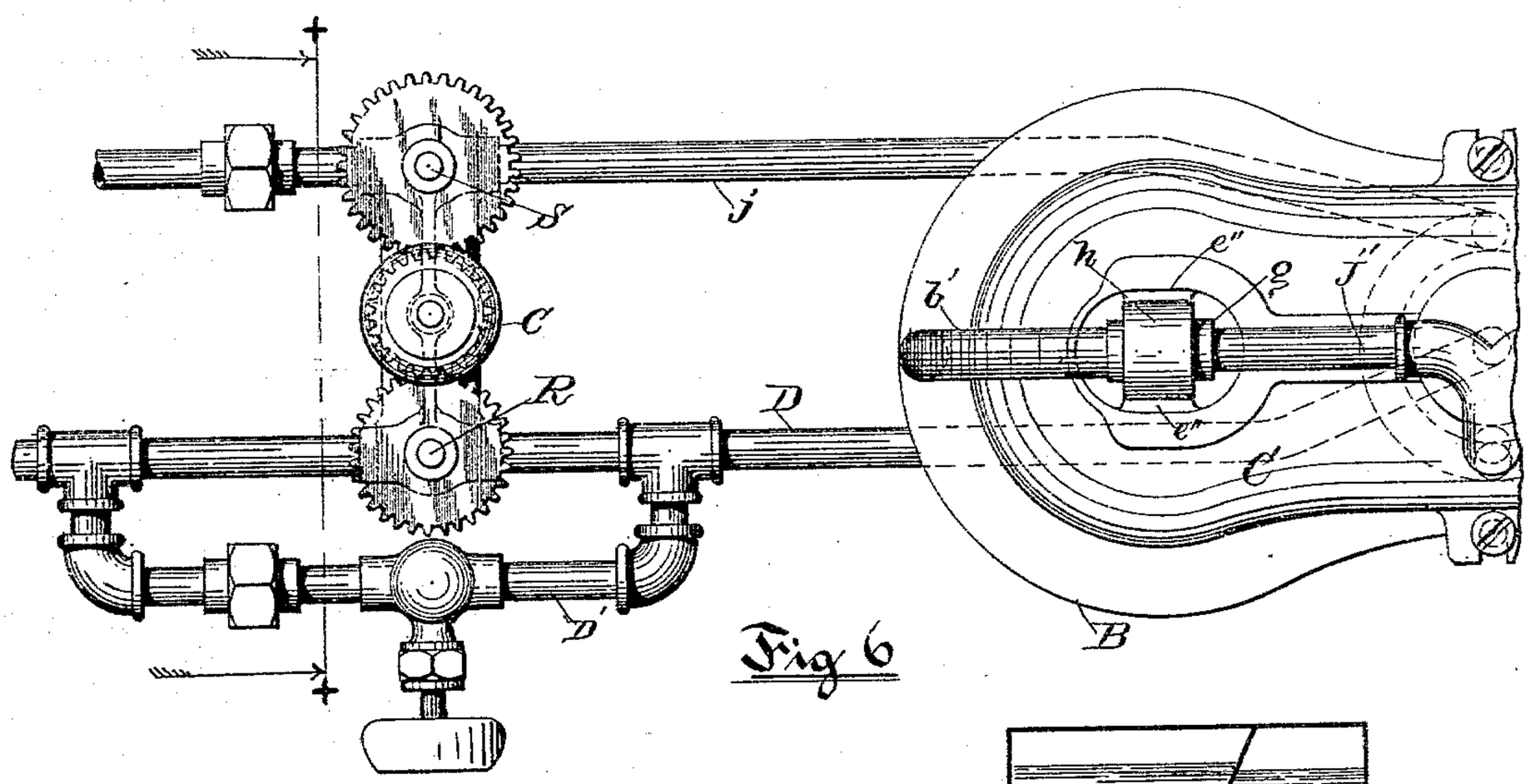


Fig 6

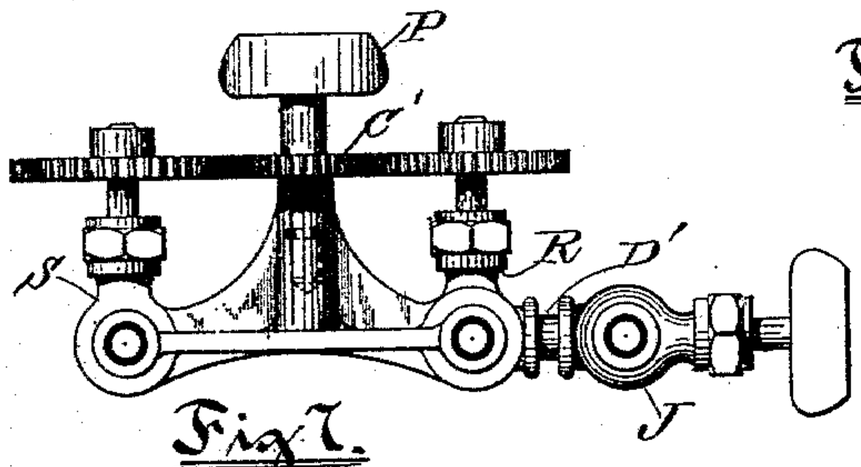
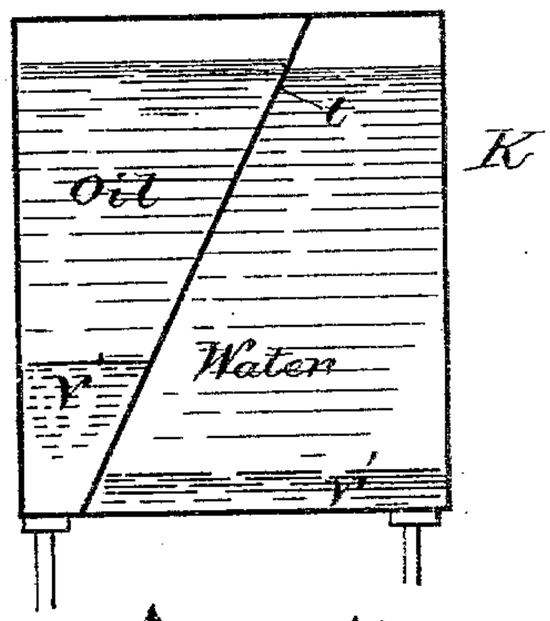


Fig 7.

Fig 8.



Witnesses

Willard a Smith.

James P. Bucklin

Inventor.

John W. Weeks.

by Benj Arnold

Attorney

UNITED STATES PATENT OFFICE.

JOHN W. WEEKS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO CHRISTOPHER A. PEIRCE, OF SAME PLACE.

OIL-GAS-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 545,325, dated August 27, 1895.

Application filed January 7, 1895. Serial No. 534,107. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. WEEKS, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Oil-Gas-Burning Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of oil-burners in which the oil is vaporized just before being consumed. It is fully explained and illustrated in this specification and the accompanying drawings.

Figure 1 is a top view of the apparatus. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical section taken lengthwise on line *x x* in Fig. 1. Fig. 4 is a vertical cross-section taken on line *z z* in Fig. 3. Fig. 5 is a horizontal section taken on line *y y* in Fig. 3. Fig. 6 shows a top view of the feed-pipe arrangement with a portion of the apparatus. Fig. 7 is a cross-section of the feed-pipes, taken on line + + in Fig. 6. Fig. 8 shows a vertical section of the feed-tank, taken through its center. Fig. 9 is a vertical cross-section on line *w w*, Fig. 2.

The object of this invention is to provide a means for burning oil in the fire-pot of an ordinary stove; and it consists of a central supply-chamber in which the oil shall be kept as cool as possible until it is about to be converted into a gas to be burned, an air chamber and passages to help keep the oil cool and to supply the flame with a heated unburned supply of air, and a water-supply to furnish steam to combine with the oil-gas in burning.

The apparatus in detail consists of a tray B, having vertically-adjustable feet N and provided with a circular opening in the center, which is covered by the chamber A, which has downwardly-projecting arms and hub *a* for supporting the lower end of the oil-supply pipe D. The supply-pipe D extends up in the center of the chamber A and forms an oil-chamber *d*, which opens at its upper end into the upper part of the chamber *b*, which has pipes *b' b'* extending out from each side near the bottom. The pipes *b' b'* form semicircular curves up at the ends of the apparatus and connect with the burner-heads *h h*.

Fitted around the upper end of the main chamber A is a hood or deflector C, having the combustion-chambers *g g* cast therein, which are open at the top and bottom. Inside the main chamber A is an air passage or chamber *f*, surrounding the oil-chamber *d*, and connected by passages *e e*, cored out in the top of the deflector or hood C, with the openings *e' e'* in the combustion-chambers *g g*. Projections *e'' e''* are made over the openings *e' e'* in the burners *g g*, so that the downward blast of the gas flame may assist in drawing the air through the passages *e e*. The air passage or chamber *f* being open at the bottom allows a free passage of fresh air to the flames in the chambers *g g*. A water-supply pipe *j* passes up through the tray B, and after being coiled several times around the main chamber A is carried to the top and divided into two branch pipes *j' j'*, which connect at their outer ends with the burner-heads *h h*. The burner-heads are shown in section in Figs. 3 and 4. They are cored out in the casting to form the steam-chamber *c c*. Their outer ends are cored out to form the chambers *r'*, which connect with the oil or gas pipes *b' b'*. Through the chamber *c c* is cast the nipple *i*, and a projection is cast on outside of head forming a continuation of said nipple *i*. Through this nipple is drilled a small hole for the escape of the oil or gas. Through the heads into the steam-chamber are drilled small holes *o o* for the escape of steam. In this way the oil or gas which reaches the nipples *i i* is kept separate from the steam until they unite in the burning-chambers *g g*.

The hood C and the tray B have feet N N, which are fastened together by the bolts, and by tightening the bolt N^2 the hood is drawn down upon the main chamber A, clamping the whole apparatus firmly together, and makes the joint in the passage *e* and *f'*, which is inclined, air-tight. Small removable hoods *m* are placed around the tops of the chambers *g g* to prevent the flame drawing in the burned air from below over the hood C and chamber *g*, which would lessen the draft of fresh air

through the openings *e e* in the sides of the chambers, and it also deadens the sound of the burning flame.

Fastened to the tray B by the bolt are feet N′, which rest upon the grate or other support of the apparatus, and have the slots to provide for adjustment.

Fig. 6 shows a plan, and Fig. 7 a section, on line + + of Fig. 6 of the oil-supply pipes D and the water-supply pipe *j* and the by-pass pipe D′. The oil-pipe D and the water-pipe *j* have separate valves R and S, geared together by the gear C′, each gear being so proportioned as to give just the proper amount of oil and water. The pipe D is provided with a by-pass pipe D′ and valve J to be used in starting. The gear C′ is provided with a hand-wheel P to open and shut the valves R and S.

The operation is as follows: The valve J in the by-pass pipe D′ is opened enough to allow a little oil to pass through the chambers *d* and *b* and the pipes *b′* and out of the nipples *i i* down into the tray B, which has a lining made of clay or other incombustible material. When sufficient oil has flowed into the tray B, the valve J is closed and the oil in the tray is lighted to heat up the apparatus and generate a gas of the oil left in the pipes *b′ b′*, which gas escapes through the nipples *i i* and is ignited in the burners. The valves R and S in the main oil and water supply pipes are opened by the hand-wheel P, allowing a fresh supply of oil to the pipes *b′* and a supply of water to pass through the coils *j*, where it is converted into steam, which escapes through the holes in the heads *h h* and combines with the flames in the combustion-chambers *g g*. The blast formed by the flame passing through the chambers *g g* draws the air through the passages *e* and *f* and the opening *e′ e′*, where it also combines with the flame to furnish more perfect combustion.

The oil and water supply tank is shown in section in Fig. 8. The tank K is divided into two compartments—one for the oil and the other for the water—by means of a partition-plate *t*, that extends from the top near one side diagonally to the bottom near the opposite side, making two receptacles that have no communication with each other. The object of this mode of making the division in the tank is that, though the two parts may have equal capacity and be filled at the same time, the level of the oil will always, after starting, be above the level of the water. As the area of the oil part, when nearly full, is so much larger than the area of the water part, the level of the water will fall the faster of the two, and when there is but a small equal quantity of each remaining in the tank the small horizontal area of the oil part will carry its level above the same quantity of water in the water part of much larger area. (See dotted lines *v′ v′*, Fig. 8.)

Having thus described my improvements, I claim as my invention—

1. In an oil gas burning apparatus, a main case or chamber having a hood or deflector with open combustion chambers at its outer ends, said deflector having air passages made in it leading from an air chamber inclosed in said case and having an inlet air passage at its lower end, to outlet openings in the sides of said combustion chambers, and a central oil pipe, substantially as described.

2. In an oil gas burning apparatus the combination of a central oil chamber opening at its upper end into a receiving chamber and surrounded by an air chamber or passage open at its lower end, combustion chambers connected by passages with said air chamber, a pipe leading from said receiving chamber to burner heads placed over said combustion chambers, substantially as specified.

3. In an oil gas burning apparatus, a main case or chamber having a central oil chamber opening at its upper end into said main case or chamber, an air passage surrounding said oil chamber having an opening at its lower end, and air passages leading from its upper end to combustion chambers, a pipe or pipes extending out from the side of said main chamber up to and over the top to burner heads, substantially as described.

4. In an oil gas burning apparatus, combustion chambers having air openings in their sides with sloping projecting hoods over said openings within the chamber to produce a suction of air from the openings by the blast of the gas flame down past the sloping hoods through the chamber, substantially as described.

5. In combination with the combustion chambers and burner heads of an oil gas burning apparatus a small movable hood to cover between said heads and chambers, to prevent the burned air from below coming up over the chambers to the flame and reducing the draft of fresh air from the opening in the sides of said chambers, substantially as described.

6. In an oil gas burning apparatus, a main chamber inclosing an air chamber open at its lower end and connected at its upper end with combustion chambers and surrounding an oil chamber or passage opening at its upper end into said main chamber, substantially as described.

7. In an oil gas burning apparatus, a main chamber inclosing an air chamber open at its lower end and connected at its upper end with combustion chambers and surrounding an oil chamber or passage opening at its upper end into said main chamber, a coil of pipe surrounding said main chamber having connection with a water supply and with burner heads arranged to keep the gas and steam separate, substantially as described.

JOHN W. WEEKS.

Witnesses:
WILLARD A. SMITH,
BENJ. ARNOLD.