

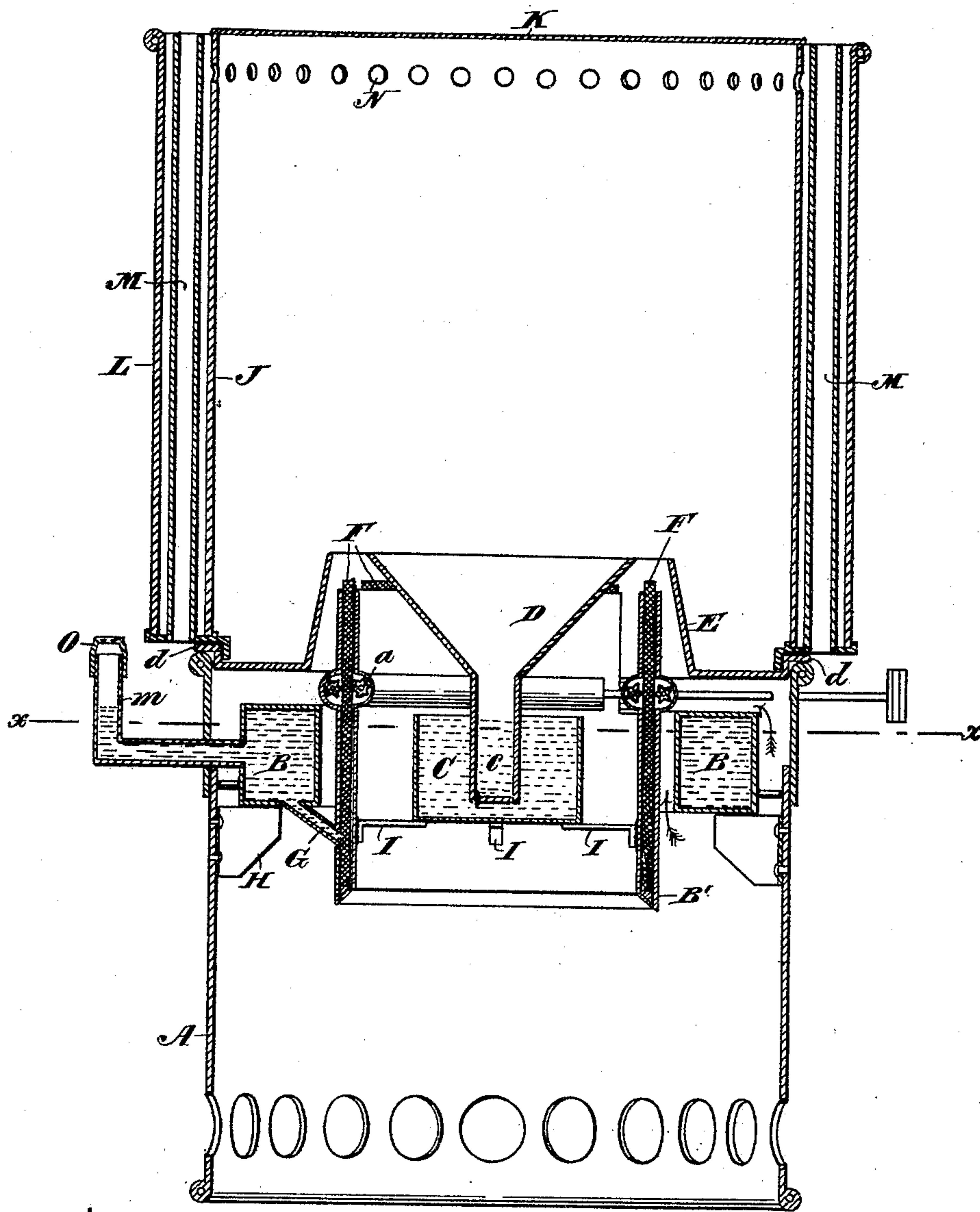
(No Model.)

2 Sheets—Sheet 1.

G. L. SWETT.
HEATER FOR HYDROCARBON OILS.

No. 462,175.

Patented Oct. 27, 1891.



WITNESSES

Luke A. Wilder
Ed H. Libby

FIG. 1.

INVENTOR

Greenleaf L. Swett

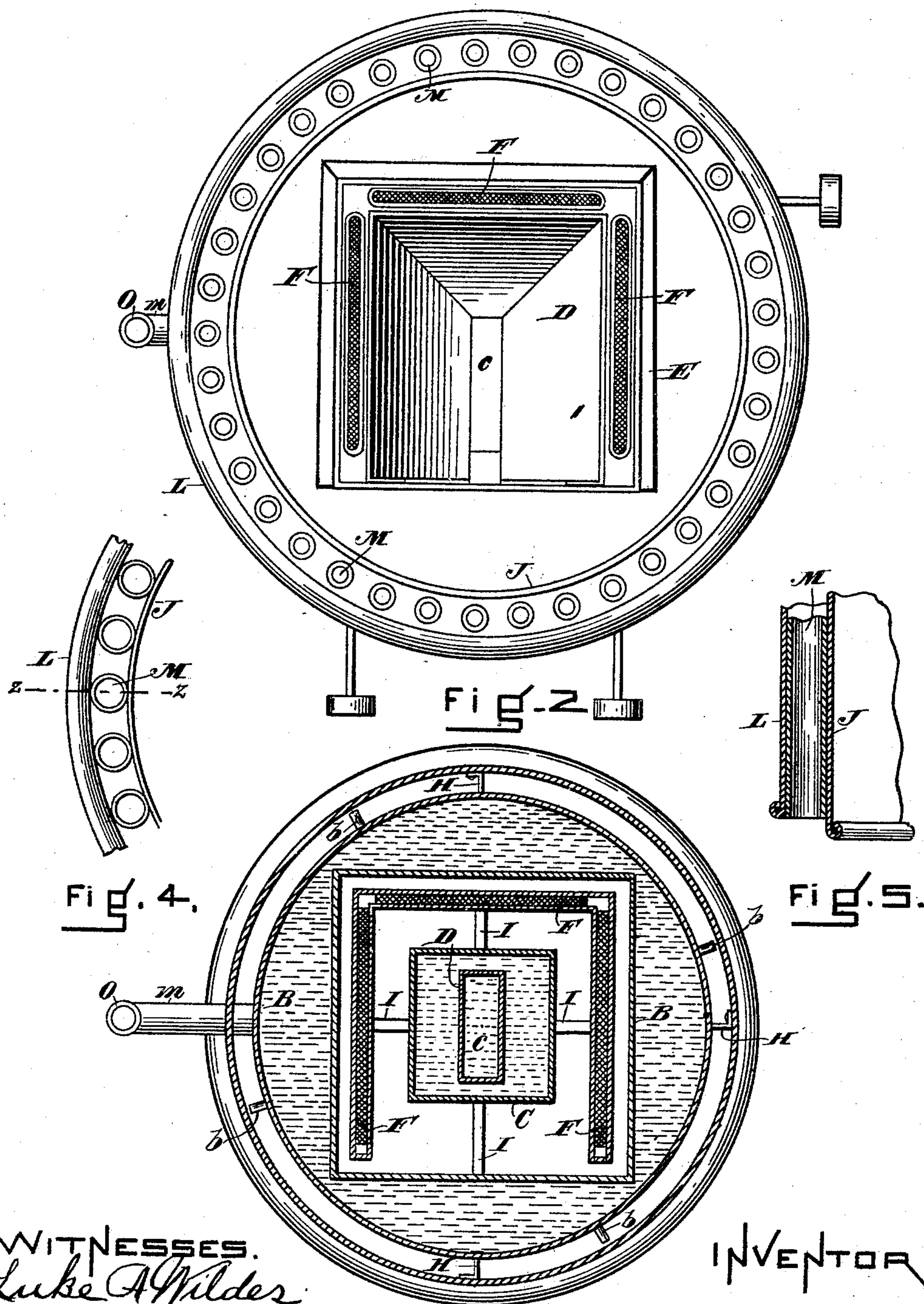
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W. H. Libby

INVENTOR

Fig. 3. Greenleaf L. Swett

UNITED STATES PATENT OFFICE.

GREENLEAF L. SWETT, OF LEOMINSTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES H. WILDER, OF BOSTON, MASSACHUSETTS, AND LUKE A. WILDER, OF CHICAGO, ILLINOIS.

HEATER FOR HYDROCARBON OILS.

SPECIFICATION forming part of Letters Patent No. 462,175, dated October 27, 1891.

Application filed November 7, 1890. Serial No. 371,107. (No model.)

To all whom it may concern:

Be it known that I, GREENLEAF L. SWETT, a citizen of the United States, residing at the town of Leominster, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Heaters for Burning Hydrocarbon Oils, of which the following is a specification.

My invention relates to certain improvements in furnaces for burning hydrocarbon oils and for effecting an economical combustion thereof without smoke, soot, or odor.

The object of my invention is to provide a novel apparatus wherein the combustion of oil of the kind mentioned may be carried on without the heating of the oil-reservoir, which not only tends to volatilize the lighter constituents of the oil, but causes the enlargement of the volume of heat and flame from the burner, thereby requiring a more or less constant attention and adjustment to prevent odor and the generation of smoke and soot.

To accomplish this object my invention involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a central vertical section of a furnace embodying my said invention. Fig. 2 is a top or plan view, the cover being removed. Fig. 3 is a transverse section taken upon the line xy of Fig. 1. Fig. 4 is a detail view of a portion of the wall of the furnace, showing the tubes upon a somewhat enlarged scale. Fig. 5 is a detail section taken upon the line zz in Fig. 4.

In the said drawings, the reference-letter A designates the base of the furnace, which is ordinarily of circular form and provided with air-openings of the well-known form.

The reference-letter B denotes the auxiliary oil-reservoir for the burners B', which are of substantially rectangular form, occupying three sides of a square, as shown in Fig. 3. Within this three-sided rectangle, each part of which is formed of flat vertical wick-tubes containing wicks F, raised and lowered by the usual wick-adjusters a , is arranged an inside shield D, having its three sides

converging toward a vertical hollow extension c depending from the lower edges of the converging walls of the shield D into a water-reservoir C, which lies within the wick-tubes and is detachably supported by brackets I.

Surrounding the burner-tubes B' is the annular oil-reservoir B for supplying said tubes, said reservoir being supported upon brackets H, riveted or otherwise fastened to the inner wall of the base A.

Projecting from the exterior of the burner reservoir are a series of radial stops b , which serve to center the reservoir, hold it upon the brackets H, and preserve it in its proper relations to the burners. Upon the outer side of the latter I arrange an outer shield E, of substantially equal height with the inner shield D and provided with a peripheral flange d , by which it is seated upon the upper edge of the base A.

Between the converging edges of the inner and outer shields D and E the flame from the wicks rises, an ample draft being provided both outside and inside the burner-reservoir B. The inner shield D is composed of some metal or metals which are good conductors of heat, and this metal is extended downward into the water in the reservoir C, whereby it is therein heated and a certain quantity of vapor given off therefrom. This vapor is divided by the two shields, one portion passing up into the air, which supports the combustion of the oil carried up by the capillarity of the wicks, while the other part passes up into and mingles with the products of combustion which are thrown off by the flame, whereby the partly-exhausted products of combustion are sufficiently enriched with oxygen to secure their more perfect and complete combustion.

Upon the base A is mounted a cylindrical reservoir composed of an inner circular wall J and an outer and parallel wall L. Upon the top of the inner cylindrical wall J is mounted a closed cover K, and a little below the same is formed a series of openings N, pierced through the inner wall J at any suitable intervals to permit passage of the products of combustion.

Between the inner wall J and the outer and parallel wall L are arranged a series of vertical tubes M, open at both ends and extending from the bottom to the top of the closed reservoir formed by the interior wall J and the cover K. By reason of this construction the air has a free passage through the said tubes M, the outer wall inclosing and preventing the waste of heat by radiation and intensifying the combustion at the point where the partly-consumed products of combustion emerge from the inner chamber, while the constant flow of atmospheric air over the annular burner-reservoir B and around the same upon all sides tends to reduce the temperature of the reservoir, being such as to permit said circulation from below and upon both its vertical sides upward.

The burner reservoir B is connected with the wick-tubes B' by means of one or more small pipes G entering said wick-tubes at or near the lower portion thereof, and having a diameter proportioned to the consumption of each wick. The burner-reservoir may be supplied from a separate reservoir, (not shown in the drawings,) or it may be filled through a supply-tube m, which is closed by a cap O. The parts being constructed and arranged as shown and described, it is only necessary to fill the oil tank or reservoir B and water-tank C, insert the wicks, and light and adjust the flames.

The water-reservoir C fulfills the conditions required to saturate the air used for combustion with vapor rising from the water, which air is thus enriched to such an extent as to effect a reduction in the quantity of oil required for a given amount of heat. The water-reservoir also supplies vapor to the products of combustion, thereby enriching them with oxygen to such an extent as to make them supporters of combustion.

The production of vapor in the water-reservoir is facilitated by constructing the inner shield D of material which is a good conductor of heat; but I do not limit myself to this inner shield for such purpose.

What I claim is—

1. An apparatus for burning hydrocarbon oil, consisting of a wick-tube having internal supports, an oil-reservoir communicating with the wick-tube, a water-reservoir independent of the wick-tube having an open top and sustained within the wick-tube by the internal supports thereof, and a conical heat-conducting shield arranged centrally within the wick-tube and having a downward extension projecting into the body of water in the reservoir to heat the latter, substantially as described.

2. An apparatus for burning hydrocarbon oil, consisting of a wick-tube having internal

supports, an oil-reservoir communicating with the wick-tube, a water-reservoir having an open top sustained centrally within the wick-tube by the internal supports thereof and from which reservoir the vaporized water rises centrally within the wick-tube, and two shields arranged, respectively, within and without the wick-tube for dividing the ascending vapor, so as to cause one portion to pass up into the air which supports the combustion of the oil and the other portion to pass up into and mingle with the products of combustion which are thrown off from the flame, the inner shield having a downward extension projecting into the body of water in the water-reservoir, substantially as described.

3. An apparatus for burning hydrocarbon oil, consisting of a wick-tube having internal supports, an oil-reservoir surrounding the wick-tube and communicating therewith, a removable and replaceable water-reservoir independent of the wick-tube having an open top and detachably resting upon the internal supports of the wick-tube, and a shield supported above the water-reservoir and having a downward extension projecting into the body of water in the reservoir, substantially as described.

4. In a furnace for burning hydrocarbon oils, the combination, with a supporting-base, of one or more wick-tubes, a separate oil-reservoir connected with said wick tube or tubes by a pipe or pipes of small diameter, an air-circulation space being left between said reservoir and the wick-tubes on one side and the supporting-base upon the other side, an inner and outer shield for said wick-tubes, and a water-reservoir arranged within the wick tube or tubes, the oil-reservoir being composed of material adapted to reflect the heat, while the inner shield is formed of material adapted to absorb the heat given off by the burner, substantially as described.

5. An apparatus for burning hydrocarbon oil, consisting of a perforated cylindrical base in which the air rises, an oil-burner supported in the upper end of the cylindrical base, and a cylindrical reservoir supported by the base and comprising outer and inner cylindrical walls, the inner wall having a closed cover and perforations adjacent thereto, and a series of air-tubes rising between the said outer and inner walls and having their lower open ends arranged outside of the cylindrical base for the ascent of the external atmosphere, substantially as described.

GREENLEAF L. SWETT.

In presence of—

LUKE A. WILDER,
R. H. LIBBY.