

No. 698,502.

Patented Apr. 29, 1902.

L. K. HOSEA.
CARBON OIL HEATER.

(Application filed May 8, 1901.)

(No Model.)

Fig. 1.

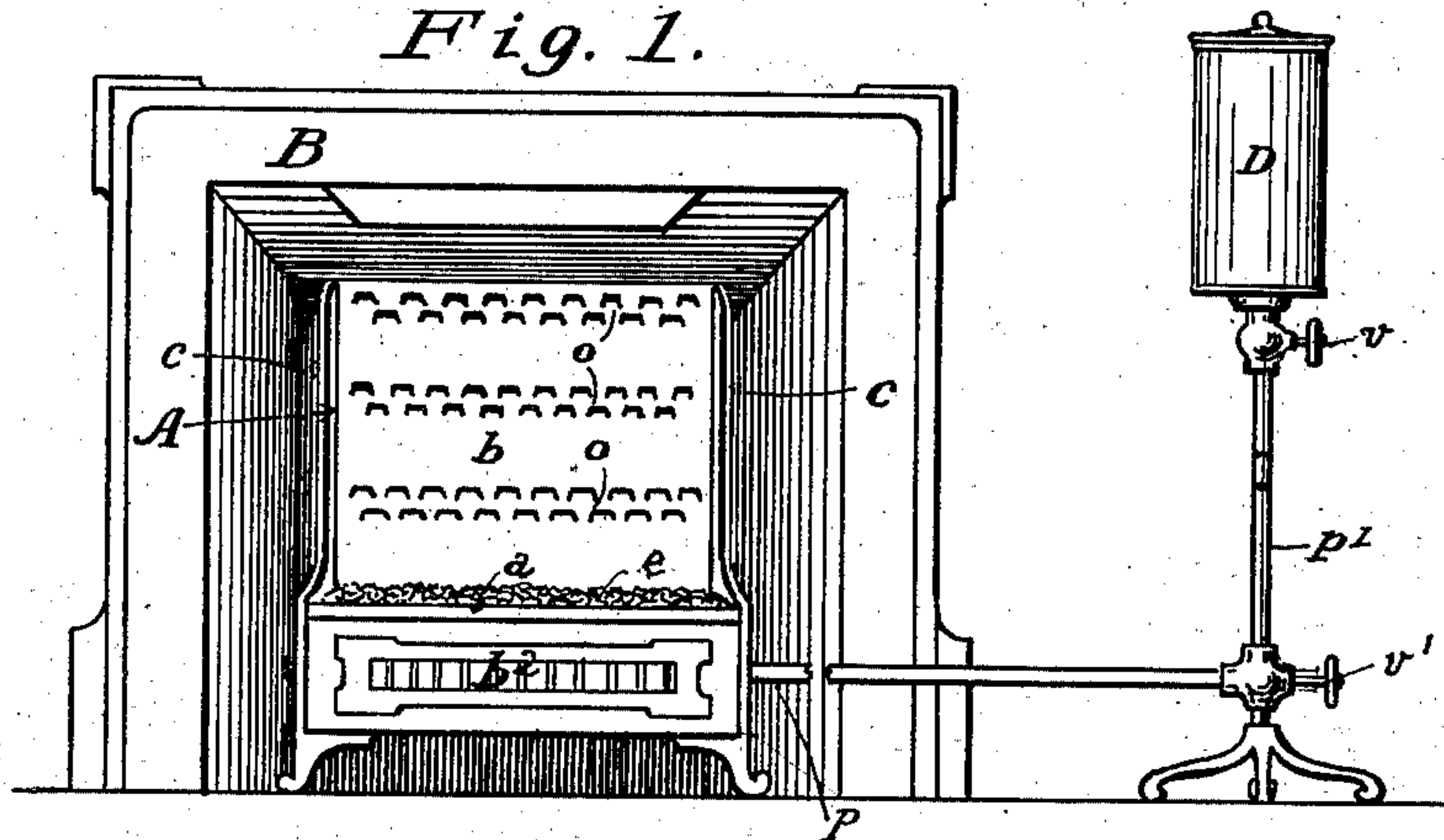


Fig. 2.

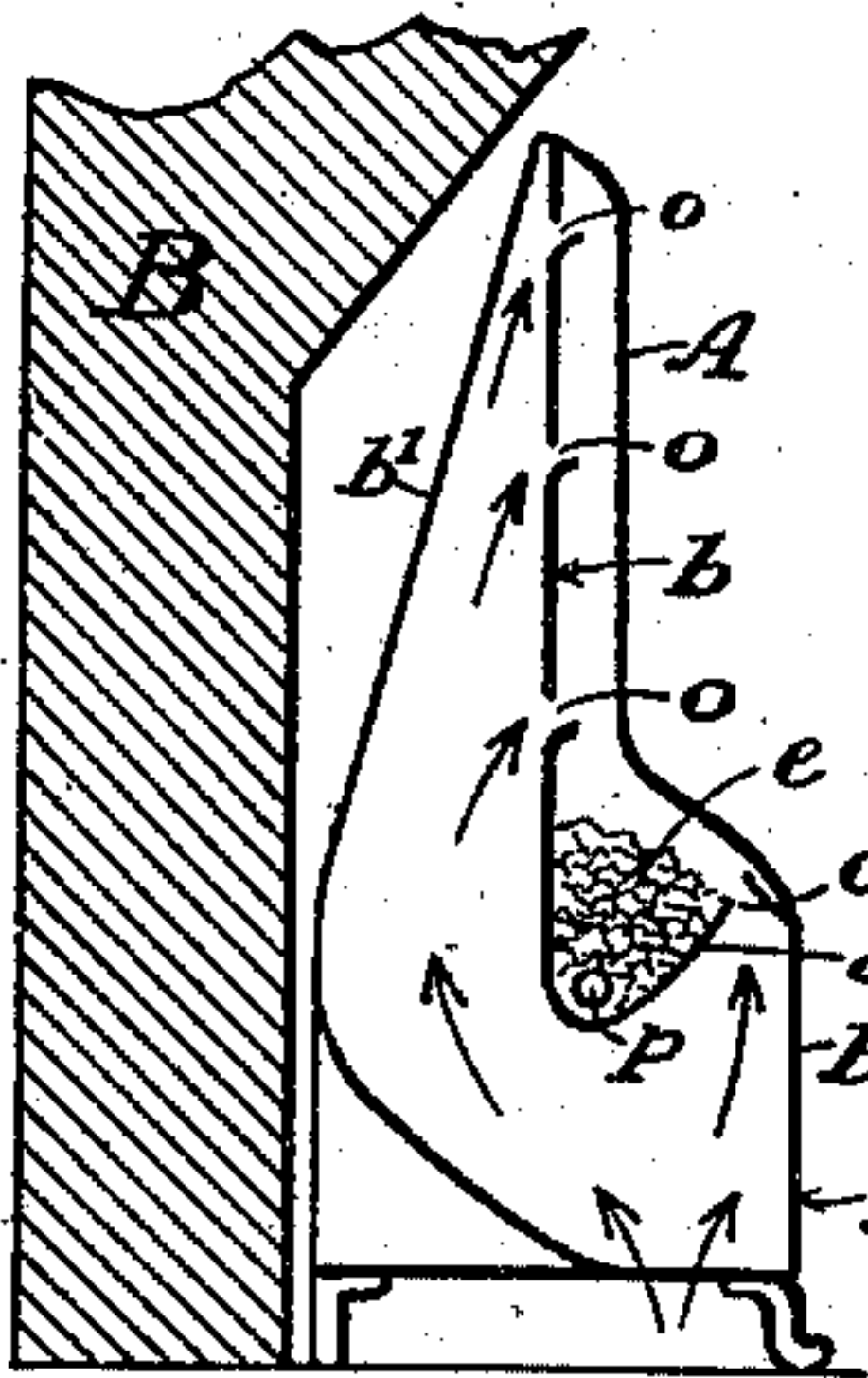


Fig. 3.

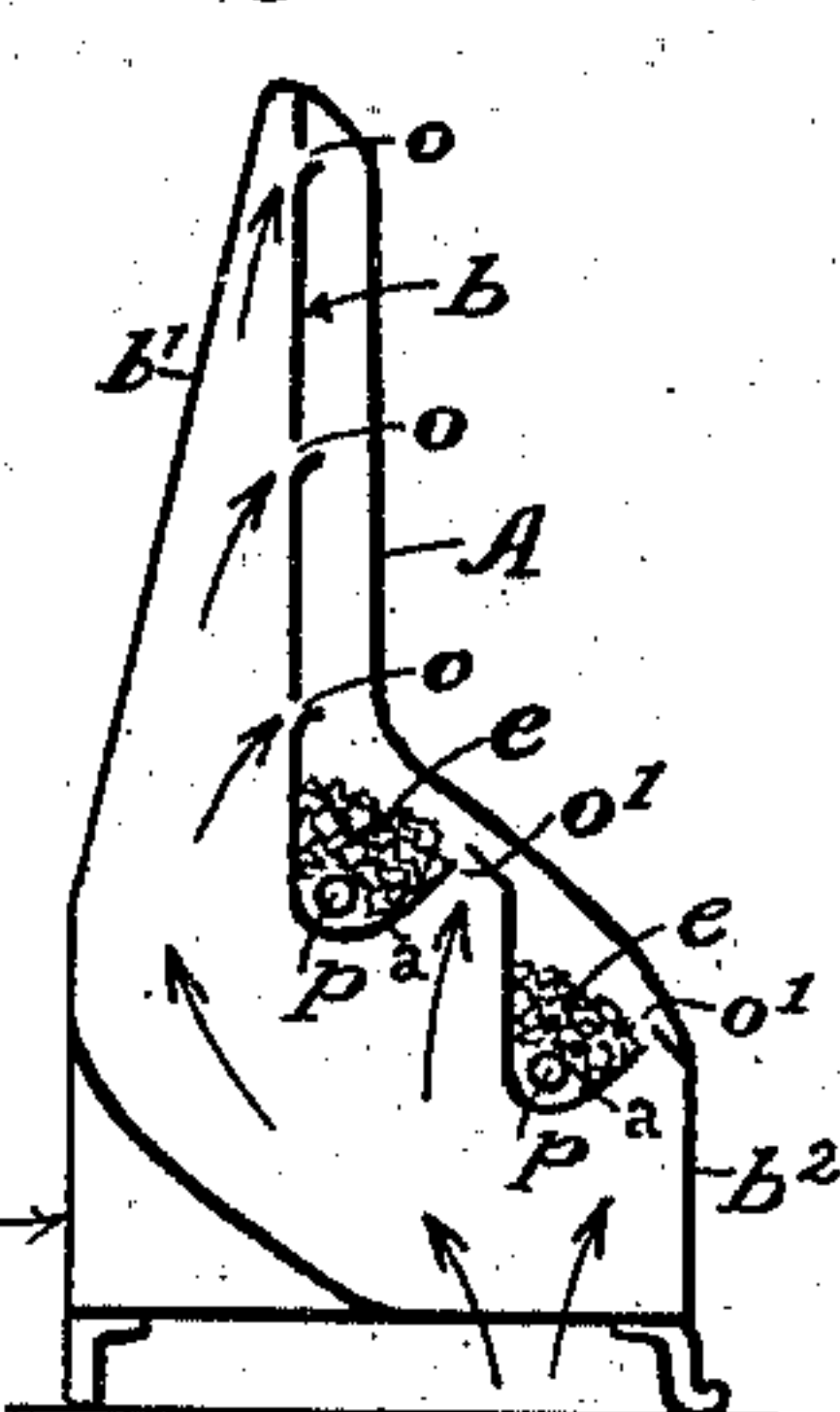


Fig. 4.

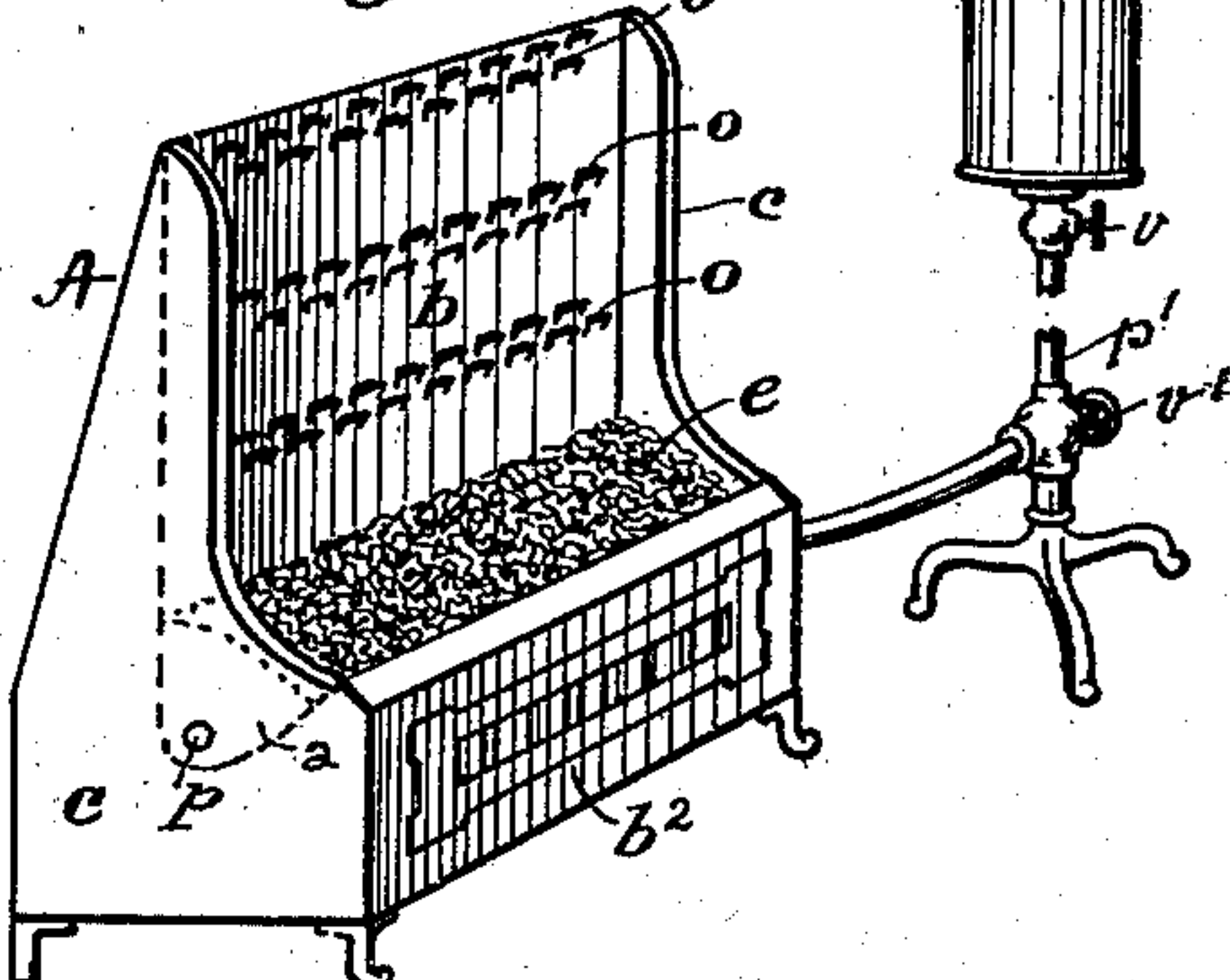
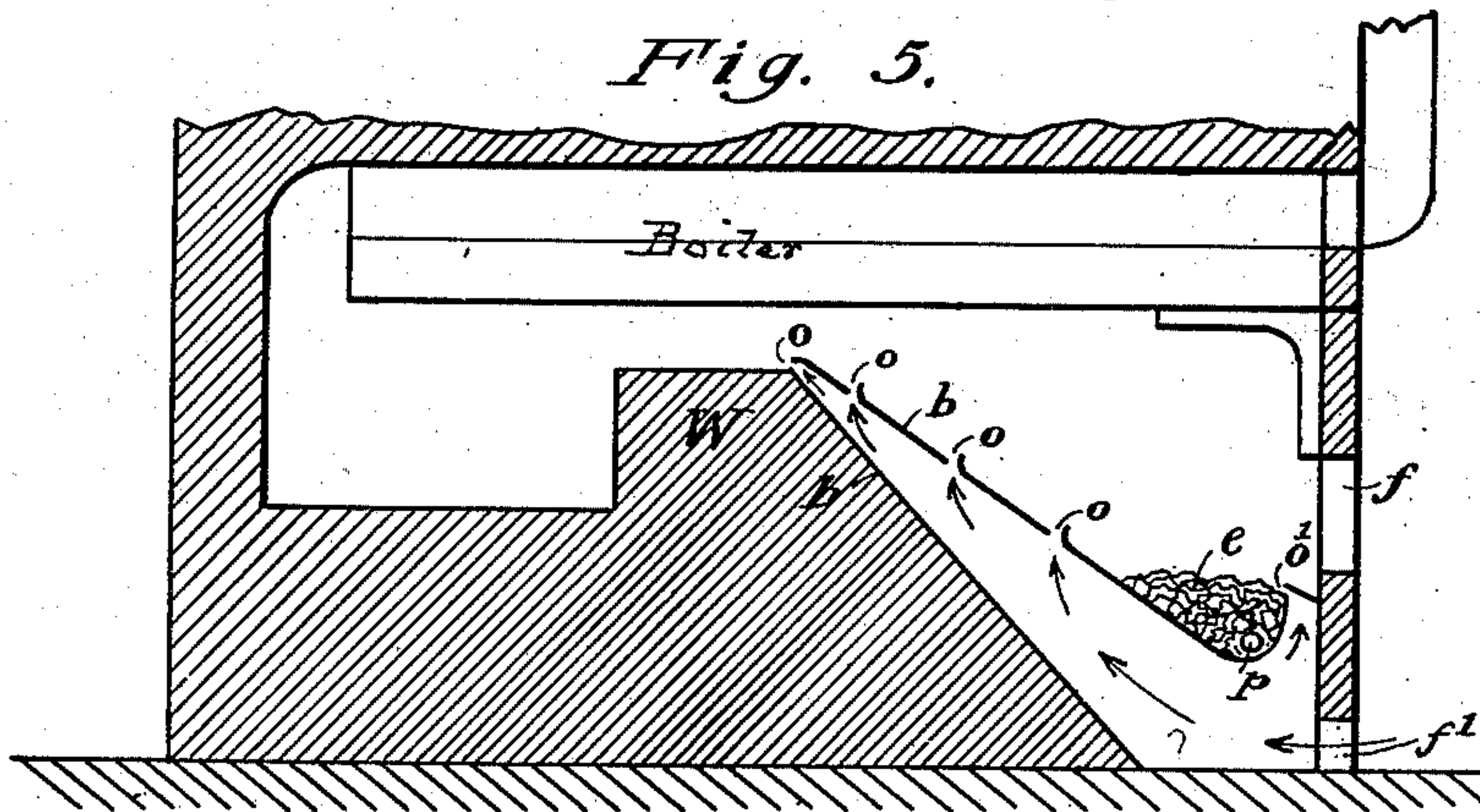


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

LUCY K. HOSEA, OF CINCINNATI, OHIO.

CARBON-OIL HEATER.

SPECIFICATION forming part of Letters Patent No. 698,502, dated April 29, 1902.

Application filed May 6, 1901. Serial No. 59,068. (No model.)

To all whom it may concern:

Be it known that I, LUCY K. HOSEA, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Carbon-Oil Heaters, of which the following is a specification.

My invention relates to hydrocarbon-burners, being a device for the utilization of "hydrocarbon oil," "kerosene," or "coal-oil" for heating purposes, more particularly for use in household fireplaces, steam-boiler furnaces, &c.; and it consists in a novel burner combined with an air-heating chamber in such relation that the flame of the burner is spread in a comparatively thin sheet over a perforated fireback, by means of which heated air is supplied to and distributed through the flame.

The device is intended to burn the oil direct, the burner being constructed and arranged to take up, distribute, and burn the oil, as a wick, as fast as fed thereto from a receiver.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my device in place in an ordinary "mantel-fireplace." Fig. 2 is a cross-section from front to rear, showing the form and construction of the trough and heating-chamber. Fig. 3 is a similar cross-section of a slightly-modified form of the heater having two feeding-troughs. Fig. 4 is a perspective view of the device detached; Fig. 5, a fore-and-aft section of the device as applied to a steam-boiler furnace.

Referring now to the drawings, the device A, which is termed a "heater," consists of two corresponding sides or end pieces *c*, between which are secured a relatively narrow and laterally-elongated trough *a*, containing a porous refractory filling *e* and provided with an oil-feed pipe *p*, laid in the trough beneath the filling, and an air-heating chamber formed between the sides *c* by a wall or "fireback" *b*, extending the rear side of the trough upward, a rear wall *b'*, and a front wall *b''*, extending from the front edge of the trough downward. The air enters this chamber below, and being heated by the sheet of

flame which rises in contact with the wall *b* draws air into itself through perforations *o*, with which the fireback is provided, and also through apertures *o'* at the upper edge of the front wall of the trough, all as more particularly herein described. In the trough from end to end is placed a feed-pipe *p*, having a series of minute perforations opening radially at the bottom, and oil is supplied thereto by gravity from an elevated tank D through suitable pipe connections *p'*, controlled by a valve *v*, or from any other source of supply—as, for example, by air-pressure from a tank below. (Not shown.)

The fireback *b* is provided with a series of minute apertures *o*, Fig. 2, preferably arranged in horizontal rows, as indicated in Figs. 1 and 4, and a similar row of apertures opens toward the trough from the front part of the air-chamber, as at *o'*.

The trough is filled in over the pipe *p* by suitable filling *e* of comminuted refractory porous material, which takes up the oil fed into the trough by the feed-pipe *p* and permits it to burn at the upper surface of the filling. Among many possible substances for this filling I have obtained best results from that prepared as follows: I take the spent ashes of bituminous or anthracite coal, sifted to exclude the larger particles, and with crude petroleum and refined oil in about equal quantities mix into a stiff mortar, which is then filled into the trough over the pipe, making a filling *e*, with a forward-slanting surface shown. In thus filling in the stiffness of the mortar permits a cavity to remain at the bottom of the trough adjacent to lower side of the pipe *p*, which facilitates the outflow and absorption of oil subsequently. When partially dried out, fire is applied to the surface of the filling and the burning hardens the mass sufficiently for use, and subsequent burnings still further harden it, yet leave the mass porous. Thus prepared the heater is ready for use. It is intended to be placed, as shown in Fig. 1, in the ordinary household fireplace B in lieu of a grate, with the supply-tank D at one side in front of the chimney or mantel-breast.

The mode of operation is as follows: The oil being allowed to flow into the trough in

minute streams as permitted by a regulating-valve v' from feed-pipe p is taken up by the filling e and burns from its surface, as from a wick, being supplied thereto by capillary attraction stimulated by the heat of the surface. The flame plays thence upward in a sheet over the fireback b , which it heats and which in turn heats the air within the inclosed space behind the fireback. The heated air passes from within the said inclosed space through the fireback outward into the flame through the minute orifices o , as indicated by arrows in Fig. 2, and mingling with the incandescent gases assists in producing an approximately perfect combustion. Heated air also passes up beneath the front side of the trough and is discharged backwardly from the front over the surface of the filling e by apertures, as indicated at o' , Fig. 2. The form and position of the trough a in relation to the fireback b causes a continuous relatively thin sheet of flame to rise upward adjacent to the fireback, supplied with heated air, in minute increments at the rear and giving a large radiating-surface of bright flame, with practically no smoke or smell, regulated by the amount of oil fed from the supply-tank. There is thus formed a substitute for a grate-fire or a "gas-log," which is economical and in a high degree satisfactory. The device can also be used in an open-front stove of the well-known "Franklin" type. In either case all the advantages of radiant heat and ventilation are realized.

The form of the device may be varied according to the taste of the maker. That shown is convenient and has proved successful in use. In practice I find it convenient to form the sides $c c$ of cast metal, between which is secured a substantially continuous apron of sheet metal, forming the walls $b b'$ and trough a . The front b^2 may be an ornamental casting securely fastened to the sides to strengthen the general frame of the heater.

I prefer to form the air-apertures o by punching outwardly a tongue or shield having an upward inclination, as indicated in Fig. 2, whereby the upcast of the incandescent gases assists in drawing out the heated air from within the inclosed space behind the fire.

The slight modification required to use the heater under a steam-boiler or other object to be heated consists practically in setting the device in a backwardly-inclined position, as shown in Fig. 5, terminating at the "bridge-wall" W . Provision is made for the admission of air at the front by doors or registers $f f'$, the latter feeding the air-chamber and discharge-openings o . Where great intensity of flame is desired, the air may be heated before permitting its entrance behind the fireback, and, if necessary, a slight pressure may

be employed for a forced discharge through the various openings.

The filling material above described is a poor conductor of heat and under all circumstances sufficiently protects the feed-pipe p and keeps it cool, so that no clogging occurs.

The closing in of the fireback to make a chamber is not absolutely essential. Good results may be obtained by omitting the back piece b' ; but the effect of closing the same in, as shown, is to produce an ascending column of heated air within the chamber, which discharges into the flame and tends to perfect the combustion.

I have shown in Fig. 3 a modified form of the device in which a tier of troughs one above and behind another are employed. In such case the ridge or ridges of separation between the troughs are perforated to permit air to pass up between the sheets of flame as they pass to and merge practically into one against the fireback.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. As a new article of manufacture an "open-fire" heater for burning kerosene, consisting of a box-shaped structure of metal having a rear wall and a wall in front thereof and constituting an air-chamber open at the bottom, and the forward of said walls terminated below by an open-top trough extended from side to side and partly bisecting the lower portion of the inclosed chamber, said forward wall having perforations through it whereby the air heated in the chamber between the two walls is discharged forwardly to mingle with the flame that passes along the front of the forward wall, and said structure having other perforations to discharge air rearwardly across the front edge of the trough.

2. An "open-fire" heater for burning kerosene, consisting substantially of two or more open-top feed-troughs disposed one above and behind the other, in combination with side, rear and front walls inclosing an air-chamber open below the troughs and extended upwardly at rear, perforated to discharge air rearwardly across the front edge of each trough and forwardly through the front wall of the vertical rear extension, the sides of the inclosure being extended forward as a curb extending from the outer edges of the lowest trough to or near the top of the vertical rear extension of the air-chamber, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LUCY K. HOSEA.

Witnesses:

L. M. HOSEA,

WALTER A. KNIGHT.