E. B. RAYMOND.

VAPOR BURNER.

APPLICATION FILED MAY 24, 1909.

956,417. **Patented Apr. 26, 1910.**

Fig. 1

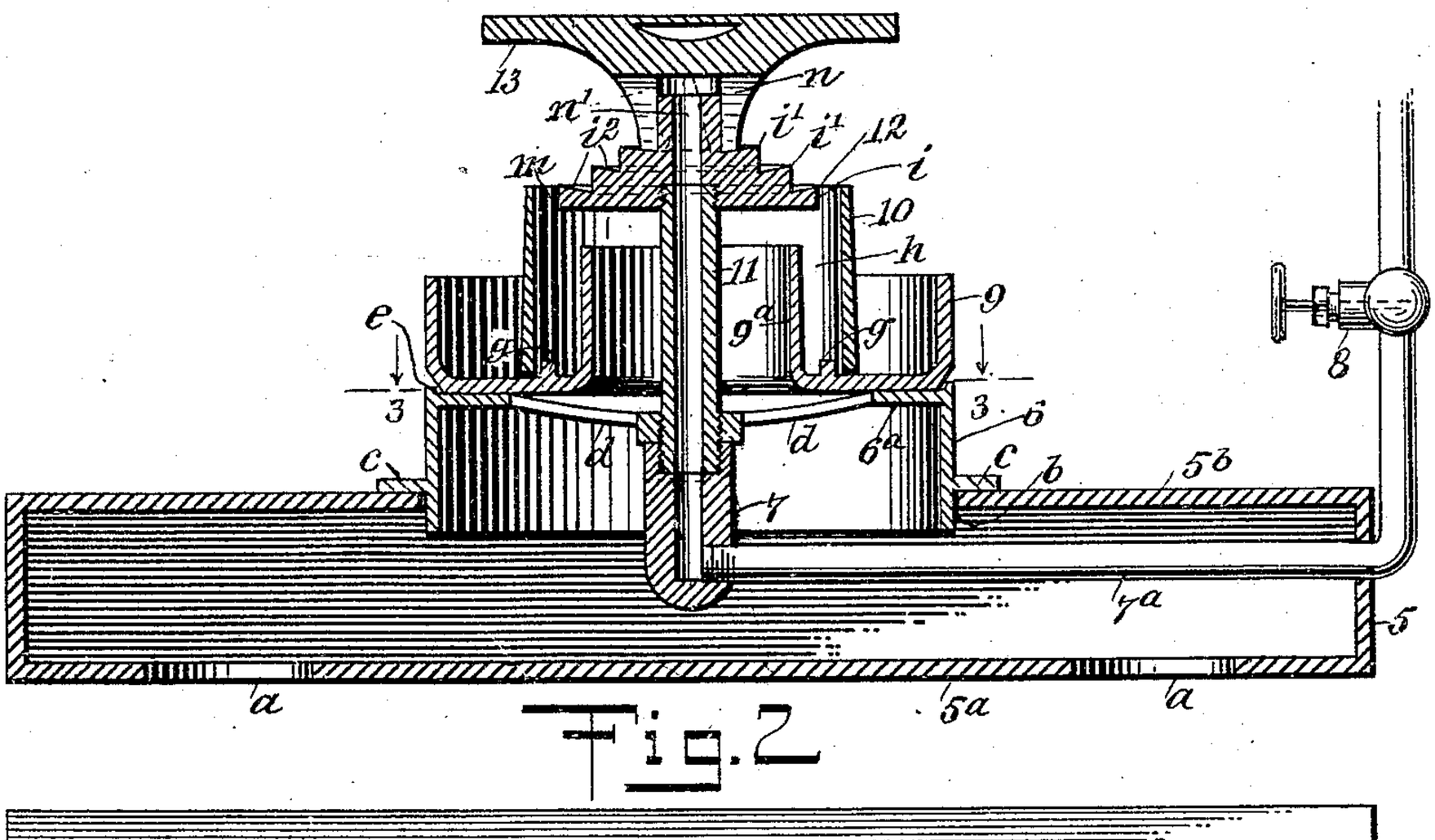

Fig. 2

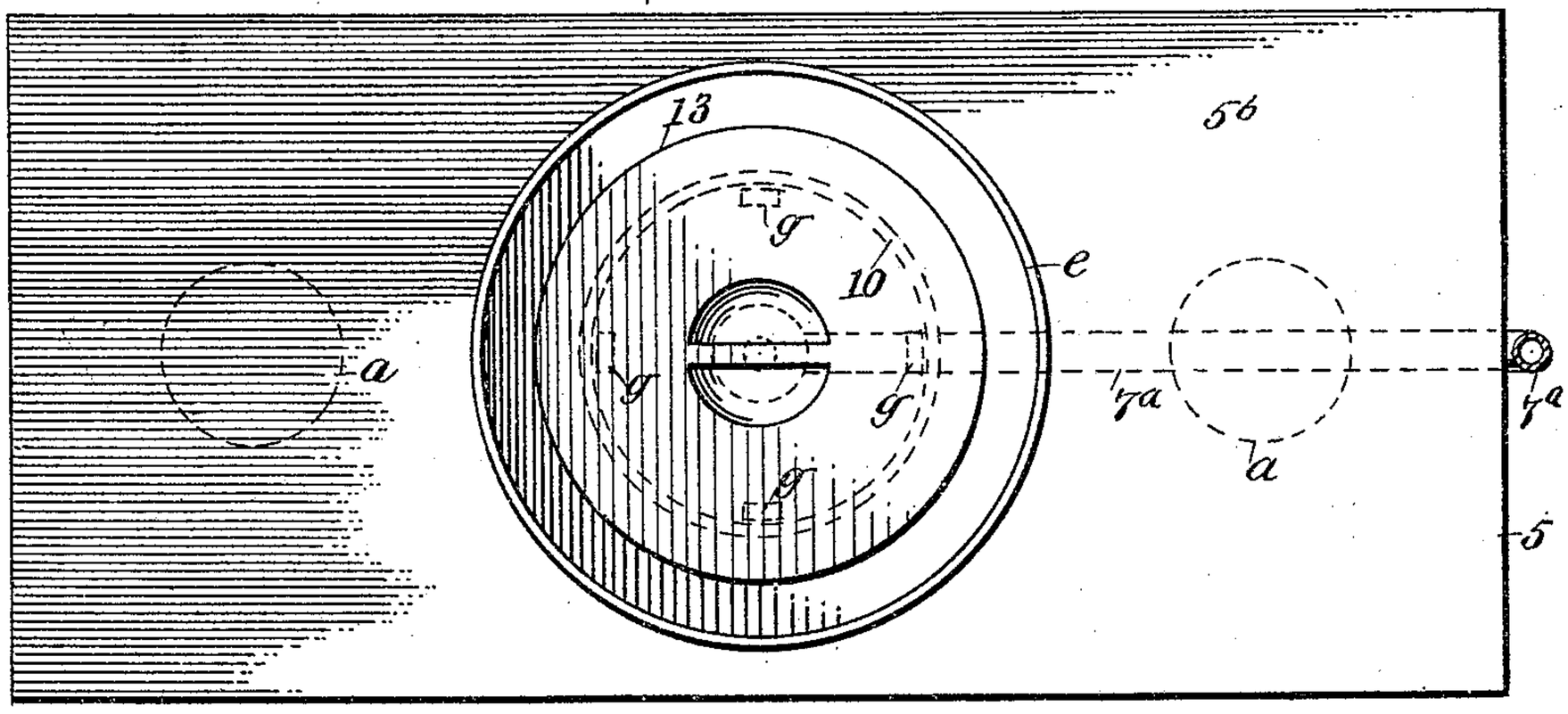

Fig. 3

WITNESSES

John A. Bergstrom

Wm. P. Patton

INVENTOR

Emmet B. Raymond

BY Munn & Co.

ATTORNEYS

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EMMET BYRON RAYMOND, OF LOS ANGELES, CALIFORNIA.

VAPOR-BURNER.

956,417. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed May 24, 1909. Serial No. 497,919.

To all whom it may concern:

Be it known that I, EMMET B. RAYMOND, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Vapor-Burner, of which the following is a full, clear, and exact description.

This invention relates to a class of burners adapted for the combustion of coal oil and its distillates for the generation of heat, and has for its object to provide novel details of construction for a burner of the class indicated, that render it capable of vaporizing and consuming heavy coal oil, without smoking or the depositing of residuum in the burner.

The invention consists in the novel construction and combination of parts, as is hereinafter described and defined in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side view of the improved oil burner; Fig. 2 is a plan view of the same, and Fig. 3 is a partly sectional plan view, substantially on the line 3—3 in Fig. 1.

The improved burner may be employed as a heater independently, but is particularly well adapted for use as a heat generator for a range or cooking stove, taking the place of coal or the like that is ordinarily burned in the fire chamber of such a stove.

Referring to the drawings, 5 represents an air chamber, that in the present construction is in the form of an oblong rectangular box, which in service is introduced within the fire pot of a range or the like and as shown in Fig. 1, the bottom wall 5^a of the box 5 is apertured at two points *a*, *a*, for the free admission of air thereinto.

In the top wall 5^b of the chamber or box 5, a circular opening *b* is formed, and within said opening the lower portion of a circularly walled base piece 6 is inserted, said part having a radial flange *c* thereon that seats upon the top wall 5^b, and affords support for the complete burner thereon. On the upper edge of the base piece 6, a top wall 6^a engages therewith at its peripheral edge; said wall that is shown integral with the piece 6 may, if preferred, be separable therefrom. In the top wall 6^a that constitutes a diaphragm, a plurality of openings *d* is formed, for the free upward passage of air that passes through the chamber 5.

Centrally from the diaphragm wall 6^a a cupped fitting 7 projects downward into the air chamber 5, and laterally from said fitting an oil feeding pipe 7^a projects into the chamber 5 through the side wall thereof, and thence extends to a source of oil supply, that should be positioned above the chamber 5 a sufficient distance to insure a proper feed of oil to the burner by gravity; and as shown in Fig. 1, a suitable valve 8 is introduced in the pipe 7 for control of the oil fed to the burner.

An annular pan 9 is seated upon the diaphragm wall 6^a, and is prevented from being displaced therefrom laterally by a rib *e* that is projected upwardly from the periphery of the base piece 6. As shown in Fig. 1, a hot air conduit is concentrically formed on the flat bottom of the pan 9 by the erection of a circular flange 9^a from the inner edge thereof.

A concentrating ring 10 is seated on the bottom of the pan 9, and disposed concentric therewith as well as with the circular flange 9^a, by spaced ears *g* that are formed on the bottom of the pan 9, and it will be seen that the relative positions of the flange 9^a and concentrating ring 10 provide an annular mixing chamber *h* between them.

The upper end of the cupped fitting 7 is interiorly threaded, receiving the threaded lower end of a hollow post 11 that projects vertically through the center of the circular flange 9^a, said post having a height about equal with that of the concentrating ring 10.

An important feature of the invention consists in the peculiar form of a flash cup 12, and deflector cone 13, formed on or secured to said flash cup. The flash cup consists of a metal disk having a circular periphery *i* and a plurality of offsets *i'* formed on its upper surface, these spaced offsets that are disposed one above the other, leaving annular surfaces between them, which are rendered concave, thus producing a shallow annular receptacle i^2 between each pair of offsets which receptacles increase in diameter from the upper one to the lower one. The flash cup 12 is centrally perforated and threaded in said perforation, that receives the threaded upper end of the post

11; and preferably the lowermost annular receptacle i^2 thereon is disposed on the same plane with the upper edge of the concentrating ring 10, from which it is spaced, thus providing a narrow annular throat m therebetween.

The deflector 13 comprises an inverted coniform body that at the lower end thereof is centrally seated upon the upper side of the flash cup 12, and may be formed integral therewith, as before mentioned; and between the deflector 13 and the flash cup 12 a transverse opening n is formed, which is intersected by a duct n' that is a continuation of the bore in the post 11.

In operation, a small quantity of the oil is fed through the post 11 upwardly, by a proper adjustment of the valve 8, so that a thin sheet of the oil will flow down over the offsets on the flash cup 12 and lodge in the annular receptacles i^2. In starting the combustion of oil, it is of advantage to use oil of a character that will ignite upon the application of flame thereto, and as the oil fed into the shallow receptacles i^2 is disposed in a thin sheet, it will be seen that upon its ignition the conical deflector 13 will quickly become hot. Oil of a heavier quality may now be fed up through the post 11, and will flow down over the flash cup. It is of advantage when starting the burner for combustion of the heating agent, that heat be temporarily applied to the exterior of the air chamber 5, so that the draft of the burner will cause an upward flow of warm air through the diaphragm wall 6^a and circular flange 9^a. The feed of oil is increased after its combustion in the flash cup 12 has been established, and as said cup and parts below it, including the pan 9, have become hot, it will be seen that hydrocarbon vapor will be evolved from the heated oil. The vapor exhaled from the oil will mix with the hot air that rises through the circular flange 9^a and escape in a jet through the annular throat m, and as it is forcibly expelled therefrom the mixed air and hydrocarbon vapor will be ignited and burn freely in a white flame, without smoking or the deposit of residuum.

As shown and described, but one of the improved burners is provided, but it is obvious that two spaced burners may be mounted upon the hot air chamber 5, and be located in the usual openings in the top plate of the stove that is above the fire-pot therein, and the burner may be so proportioned that the deflectors 13 will be disposed slightly below the top plate of the stove, thus enabling the convenient use of the burners for cooking purposes. It is also to be understood that if desired, the improved burner may be placed in a heating stove that is cylindrical in the body, the hot air box of the burner in this case being shaped so as to loosely fit in the cylindrical fire chamber of the stove.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A vapor burner, comprising a circular base piece, an apertured diaphragm plate thereon, a pan seated on the diaphragm plate and having a circular upright flange thereon defining a central opening therein, a concentrating ring seated in the pan concentric with the flange, a hollow post carried by the diaphragm plate, a flash cup on the post, and a coniform deflector on the flash cup.

2. A vapor burner, comprising a circular base piece, an apertured diaphragm plate on said base piece, an annular pan carried by the diaphragm plate and having a concentric upright flange on its inner edge, a cupped fitting depending from the diaphragm plate, a lateral feed pipe on the cupped fitting, a hollow post disposed centrally upright on the diaphragm plate, the bore in which alines with that in the fitting, a concentrating ring seated in the pan and disposed concentric with the flange, a flash cup having offsets and annular receptacles on the upper side thereof, said cup being mounted upon the post, and an inverted coniform deflector on the flash cup.

3. A vapor burner comprising a base, a diaphragm plate provided with apertures and supported on the base, a pan seated on the diaphragm plate and having an upright annular flange, a concentrating ring encircling the flange and seated in the pan, a hollow post carried by the diaphragm plate, a flash cup on the post, and a deflector above the flash cup.

4. A vapor burner comprising a base piece, a diaphragm plate having apertures and supported by said base piece, an annular pan carried by the diaphragm plate and having a flange on its inner edge, a hollow post extending through the diaphragm plate, a feed pipe discharging into the post, a concentrating ring seated in the pan and encircling the flange, a flash cup having offsets deepened toward their inner edges mounted on the post, and a deflector on the flash cup.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMMET BYRON RAYMOND.

Witnesses:
LEE ROY RAYMOND,
ERNEST FRANKLIN RICE.