

F. R. & N. BLOUNT.
HYDROCARBON BURNER.
APPLICATION FILED APR. 21, 1909.

967,315.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

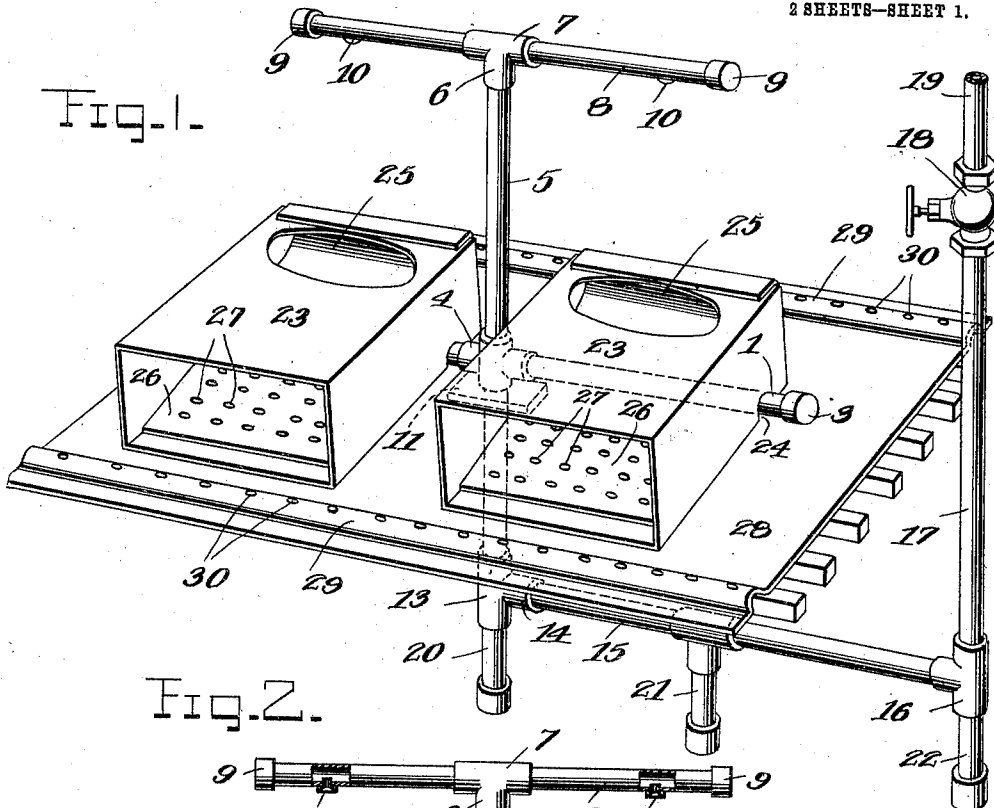


Fig. 2.

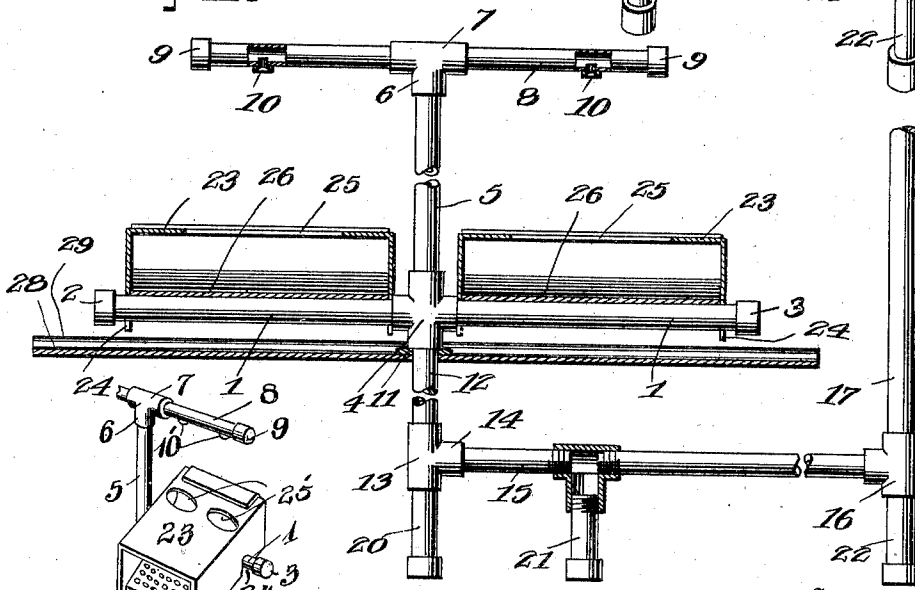
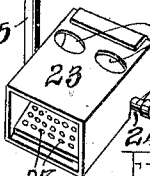


Fig. 6.



Witnesses

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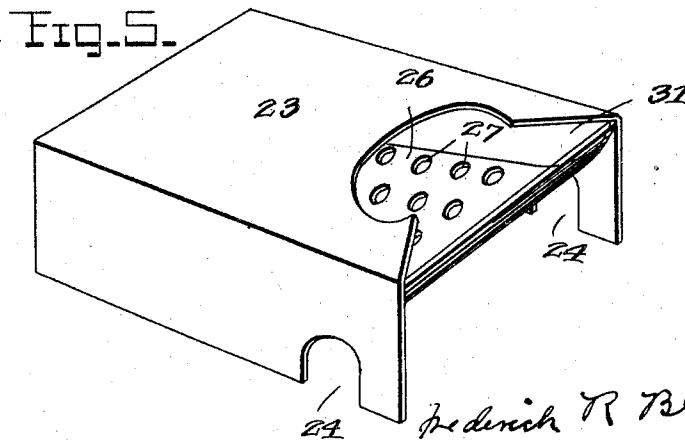
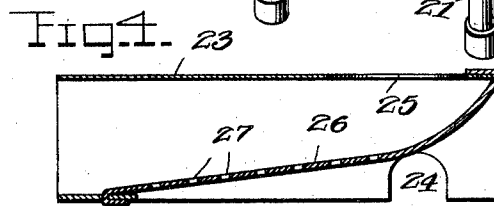
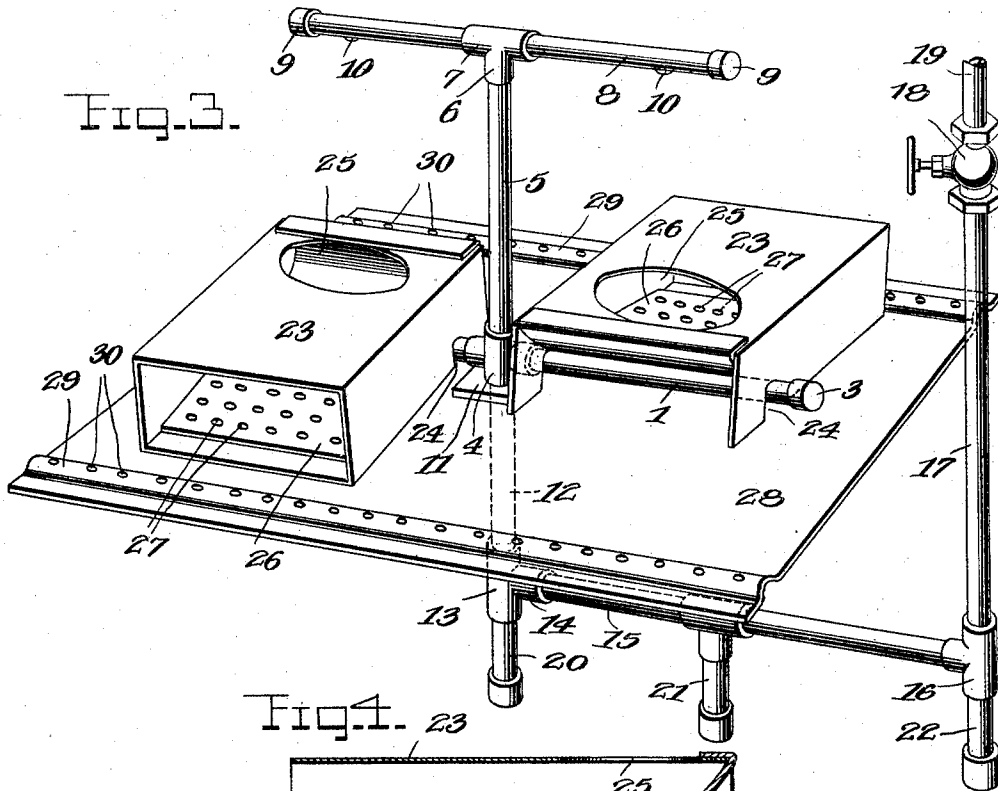
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK R. BLOUNT AND NELSON BLOUNT, OF NEW YORK, N. Y.

HYDROCARBON-BURNER.

967,315.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed April 21, 1909. Serial No. 491,308.

To all whom it may concern:

Be it known that we, FREDERICK R. BLOUNT and NELSON BLOUNT, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

This invention relates to hydrocarbon burners, or burners adapted for vaporizing and burning kerosene or other refined petroleum oil, or hydrocarbons, and is designed for use in the fire boxes of cooking stoves, ranges, heating stoves and furnaces to take the place of coal or other fuel.

The primary object of the invention is to provide a burner of a construction that will insure a perfect and uniform mixture of air and gas producing an extremely hot, steady and uniform flame, which will be under perfect control and capable under such control of producing a heat abundantly sufficient for all cooking operations.

A further object of the invention is to provide a burner in which the draft may be regulated so as to cause the flame to almost entirely leave the mixing chamber, thus subjecting the primary vaporizing pipe to a radiant heat, only, which is sufficient to vaporize or gasify the oil, but is not sufficient to cause carbonization in the pipes, which carbonization, as is well known, has been one of the principal drawbacks to the successful operation of burners of this character.

The invention further contemplates the provision of a burner in which dirt or sediment traps are provided to catch the hard substances that may be in the oil and prevent them from being forced into the pipes to jet points.

A further object of the invention is to provide a burner which will have certain adjustable features whereby the mixing chambers may be disposed in different positions, so that the heat may be directed to different points in the fire box, as the exigencies in the case may require, as will be fully set forth in the following specification.

Another object of the invention is to provide a highly efficient burner of this character with extreme simplicity and economy of construction, composed of few parts easily assembled and easily adjusted or re-

arranged without the necessity of expert mechanical skill, to meet conditions that may arise in installing the burner in stoves of slightly varying construction, as where the burner is to be adapted for use in a two oven stove or range where the fire box is located between the ovens and it is desired to direct the flame toward each oven. The heat developed by the burner is sufficient and more than is required to thoroughly heat the oven, the water-back and top of the stove for all cooking operations, practice having demonstrated that a heat of over four-hundred degrees is obtainable, which is in excess of that required and the intensity of the heat as before suggested, may be readily controlled.

Other objects and advantages of the invention will become apparent in the course of the following description and the points of novelty will be set forth in the claims.

In the drawings illustrating the invention: Figure 1 is a perspective view of the burner, upon its supporting plate, there being shown in dotted lines the ends of the grate bars of the fire box upon which the supporting plate rests; Fig. 2 is a longitudinal section of the burner, the vaporizing and jet pipes being in elevation; Fig. 3 is a perspective view of the burner showing one of the mixing chambers or boxes reversed from the position shown in Fig. 1; Fig. 4 is a vertical longitudinal section of one of the mixing chambers; Fig. 5 is a perspective view of a slightly modified form of mixing chamber; and Fig. 6, is a detail perspective view, showing a slightly modified construction of mixing chamber and jet-pipe.

Referring to the drawings, the numeral 1 designates what we will term the primary vaporizing pipe. This pipe is closed at both ends as indicated by the numerals 2 and 3. In the center of this pipe we provide a four-way connection 4, and into the upper vertical arm of this connection is threaded a vertical pipe 5, which at its upper end is threaded into the short arm 6 of the three-way connection 7. Threaded into the connection 7 is a jet pipe 8 closed at its ends as indicated at 9. This jet pipe is provided with two jets 10, which project the oil vapor downward toward the mixing chambers. Integral with the connection 4 is a transverse base 11 which may rest upon any suit-

able support, but in the present instance, upon a supporting plate as will be later described.

Threaded into the lower vertical arm of the connection 4 is a vertical pipe 12 whose lower end is threaded into a T-connection 13, which has threaded into its lateral arm 14 horizontal pipe 15, which pipe 15 is in turn threaded into the lateral arm of a T-connection 16 into which connection is threaded a vertical pipe 17 provided at any suitable point in its length with a regulating valve 18. Connected with this valve is a pipe 19 which may be connected with any suitable source of oil or other fluid from which an inflammable gas may be produced by vaporization. In the embodiment of our invention as illustrated in the drawings, we prefer to employ a number of dirt traps 20, 21 and 22 which communicate with that portion of the piping which may be regarded as the feed pipe or the pipe through which the oil or other vaporizable fluid passes to the portions of the burner whereat vaporization takes place.

The numeral 23 designates the mixing chambers. In the preferred form, and as shown in Figs. 1 to 4 inclusive, there are two of these chambers, one mounted upon each arm of the vaporizing pipe. The mixing chambers are identical in construction and a description of one will serve as a description of both. The mixing chamber is box-like in form having oppositely disposed slots 24 which are open at their lower ends and are adapted to embrace the vaporizing pipe. The top of the chamber is provided near one end with an opening 25 which, when the parts are assembled comes directly below one of the jets in the jet pipe, so that the discharge of the gas into the chambers will be directly above the vaporizing pipe, thereby quickly bringing said pipe into a highly heated condition, so as to more thoroughly and quickly vaporize the oil and superheat the gas passing through said pipe when the burner is being lighted and maintaining the pipe in a condition wherein the gas is uniformly and quickly generated during the operation of the burner. Extending transversely from one side of the chamber to the other, between the top plate and the lower edge thereof is a plate 26 which inclines upwardly from the lower edge of the open end of the chamber to the rear top plate. The rear portion of this plate 26 forms a closure for the mixing chamber at its rear end, as clearly shown, and said plate is provided with a plurality of small perforations or air inlet openings 27, through which air passes upwardly and commingles with the gas as it passes through said chambers. By mounting the mixing chambers upon the vaporizing pipe, which pipe is some little distance above the burner sup-

port, a space will be left under each mixing chamber through which air may freely pass under said chambers and upward through the openings.

The numeral 28 designates the burner support which we preferably use in connection with the burner to increase its efficiency. This support may be of any suitable material and is in the form of a plate cut to accurately fit the fire box and to cover the space between the grate bars to prevent an excessive amount of air passing to the burner, for it has been demonstrated beyond doubt that the successful operation of burners of this class depends to a large extent upon the draft control. When too much air is admitted to the fire box, a yellow flame is produced of low heat intensity, whereas, on the other hand, if the burner is under such control as to admit a limited amount of air to the fire box under control within the range of damper manipulations in the stove pipe, a flame of intense heat is developed, without the disagreeable and objectionable incidents of roaring or noise in operation. Nevertheless, a certain amount of air must be admitted to the fire box and to provide for this, we provide along the edge or edges of the plate 28, a rib 29, and throughout the length of the rib, we provide a series of air holes 30, which admit air above the plate in close proximity to the open mouth of the mixing chamber, so that the air and oil gas issuing from said chambers will receive another supply of air near the edge of the support, which, due to the highly heated condition of the gas and air mixture from the chambers, will unite with the flame around the chambers, producing a more intense heat.

As shown in Fig. 4, the arrangement of one or both of the mixing chambers may be reversed. Say, for instance, it is desired to change the position of the chamber which is nearest to the valve 18. This is accomplished by simply lifting the mixing chamber from the pipe, reversing it and placing it back upon the pipe, with its open end opposite to the open end of the companion chamber, and by so doing, the gas will be projected to the opposite side of the fire box. Both chambers can be obviously, manipulated in the same way, which is highly advantageous where it is desired to place the burner in a stove in which the oven is to the right of the fire box. This is an important feature of the invention and renders it possible to adapt the burner quickly to any stove whether the oven is on the right or left of the fire box or to adapt it for use in a stove in which the fire box is between two ovens.

In the modification, Fig. 5, the rear end of the mixing chamber is left open as indicated by the numeral 31, so that air may be brought directly in contact with the vapor jet as it passes into the mixing chamber.

In operation, the valve 18 is opened, letting oil into that portion of the pipe constituting the feed pipe from whence it passes to the vaporizing pipes above the plate 28. The oil before the burner is started, will fill the pipes and overflow at the jets and in order that this overflow oil may be readily lighted, we may provide upon the plate 28, a suitable absorbent mat such as asbestos, which becomes saturated with the oil, which is lighted to supply the initial heat which is sufficiently intense to vaporize the oil within the pipes, causing an inflammable vapor to issue from the jets. The pipes will then be in such highly heated condition that the oil or other fuel that follows it, will be quickly vaporized and changed into an inflammable gas which issues with considerable force from the jets in a downward direction through the openings 25 in the mixing chambers and said gas coming in contact with the highly heated surface of the plates 26 will ignite and burn, producing a heat of great intensity. The feature of projecting the gas into the vaporizing chambers immediately above the primary vaporizing pipe only, keeps this pipe in a highly heated condition, assuring quick lighting of the burner as well as a steady and uniform vaporization of the fuel after the burner has been lighted a short time. As has been suggested in the description, the gas passes through the openings 25 in the top plates of the mixing chambers and is deflected toward the mouths of the chambers, receiving a supply of air through the perforations in the bottom plates of said chambers, as it passes there-through, toward the perforations in the edge of the support 28, where further air is supplied.

We have found in practice, that the construction of the burner is such that we are enabled to regulate its heat to a great nicety, it being possible to turn the flame up or down, as the cooking or heating needs may demand. Any sediment or foreign substance that may be in the oil is trapped by the traps 20, 21 and 22, and any byproduct of the oil that may be formed under the conditions arising in the operation of the burner will be arrested by the traps. It will be noted that the feed pipe and the pipe 12 are considerably below the supporting plate 28, and at no time during the operation of the burner are these pipes highly heated, thus reducing to a minimum the likelihood of the formation of substances that would clog the vaporizing and jet pipes.

We do not desire to be understood as limiting ourselves to a construction wherein two chambers are employed as it is obvious that it will be quite within the scope of mechanical skill, where a lower degree of heat is required, to eliminate one of the chambers

and one arm of the jet pipe. This form of single burner has been shown to produce a very intense heat, quite sufficient for ordinary cooking or heating purposes, nor do we limit ourselves to the exact constructions shown and it is to be understood that changes in the scope of the invention may be made without departing from the spirit thereof.

As shown in Fig. 6, we may provide openings 25' in the mixing chamber, and provide the jet-pipe with a jet 10' for each chamber opening, whereby the capacity of the burner is increased.

Claims:

1. A hydrocarbon burner, comprising a vaporizing-pipe, a mixing-chamber reversibly-mounted upon said vaporizing-pipe, whereby the open end of said chamber may be located at either side of the fire-box, and a jet-pipe supported from the vaporizing-pipe, above the mixing-chamber, and arranged to discharge into the mixing-chamber.

2. A hydrocarbon burner, comprising a vaporizing-pipe, a plurality of mixing-chambers reversibly-mounted upon said vaporizing-pipe whereby the open end of said chamber may be located at either side of the fire box, and a jet-pipe supported from the vaporizing-pipe and arranged to discharge into each mixing-chamber.

3. A hydrocarbon burner, comprising a vaporizing pipe, a mixing chamber reversibly-mounted upon said vaporizing-pipe, a perforated deflecting-plate arranged within said mixing chamber, and a jet-pipe, supported from the vaporizing-pipe and arranged to discharge into the mixing-chamber.

4. A hydrocarbon burner, comprising a vaporizing-pipe, a plurality of mixing-chambers reversibly-mounted upon said vaporizing-pipe, a perforated deflecting plate arranged within each mixing-chamber, and a jet-pipe supported from the vaporizing-pipe and arranged to discharge into each mixing chamber.

5. A hydrocarbon burner, comprising a vaporizing-pipe, a supporting-plate provided at its side edges with a plurality of air-passages, a mixing-chamber reversibly-mounted upon the vaporizing-pipe, a perforated deflecting-plate arranged within said mixing-chamber, and a jet-pipe supported from said vaporizing-pipe and arranged to discharge into the mixing-chamber.

6. A hydrocarbon burner, comprising a vaporizing-pipe, a supporting-plate provided at its side edges with a plurality of air-passages, a plurality of mixing-chambers reversibly-mounted upon the vaporizing-pipe, a perforated deflecting-plate arranged within each mixing-chamber, and a

jet-pipe supported from said vaporizing-pipe and arranged to discharge into each mixing-chamber.

7. A hydrocarbon burner, comprising a vaporizing-pipe, a mixing-chamber reversibly-mounted upon said vaporizing-pipe, whereby the open end of said chamber may be located at either side of the fire-box, and provided with an opening in its top, and a jet-pipe supported from the vaporizing-pipe above the mixing-chamber, and arranged to discharge into the mixing-chamber through the opening therein.

8. A hydrocarbon burner, comprising a vaporizing-pipe, a plurality of mixing-chambers, reversibly-mounted upon said vaporizing-pipe, whereby the open end of said chamber may be located at either side of the fire-box, and provided with openings in the top thereof, and a jet-pipe supported from the vaporizing-pipe, above the mixing-chambers, and arranged to discharge into each mixing-chamber through the opening therein.

9. A hydrocarbon burner, comprising a vaporizing-pipe, a mixing-chamber reversibly-mounted upon said vaporizing pipe and provided with an opening in the top thereof, a perforated deflecting-plate arranged within said mixing-chamber, and a jet-pipe supported from the vaporizing-pipe, above the mixing-chamber, and arranged to discharge into the mixing-chamber through the opening therein.

10. A hydrocarbon burner, comprising a vaporizing-pipe, a plurality of mixing-chambers, reversibly-mounted upon said vaporizing-pipe and provided with openings in the tops thereof, a perforated deflecting-plate arranged within each mixing-chamber, and a jet-pipe supported from the vaporizing-pipe, above the mixing-chamber, and arranged to discharge into each mixing-chamber through the opening therein.

11. In a burner of the character described, the combination of a vaporizing pipe, a jet pipe in communication with the vaporizing pipe, a mixing chamber removably and re-

versibly mounted upon the vaporizing pipe, said chamber having a bottom plate provided with perforations and an opening in its upper plate through which latter opening the jet pipe discharges.

12. In a burner of the character described, the combination of a vaporizing pipe, a jet pipe in communication with the vaporizing pipe, a mixing chamber having perforations in its bottom, said chamber being mounted on said vaporizing pipe and having an open end and an opening through which the jet discharges, a feed pipe below the vaporizing pipe and communicating with the vaporizing and jet pipes, traps for the purpose set forth, within the feed pipe, and means for regulating the supply of fuel to the burner.

13. In a burner of the character described, the combination of a vaporizing pipe, a jet pipe in communication with the vaporizing pipe and a plurality of mixing chambers removably and adjustably mounted upon the jet pipe, said chambers having bottom plates with perforations therein and top plates with apertures through which the jets from the jet pipes discharge and a feed pipe below the vaporizing pipe and communicating with said vaporizing pipe and jet pipe, sediment traps in said feed pipe below the jet pipe and means for controlling the admission of fuel to the burner.

14. In a burner of the character described, the combination of a vaporizing pipe, a jet pipe in communication with the vaporizing pipe, a plurality of box-like mixing chambers having perforations in their bottoms, and an aperture in their upper plates, through which the jet pipe discharges, said chambers being removably and reversibly mounted upon the jet pipe.

In testimony whereof we affix our signatures in presence of two witnesses.

FREDERICK R. BLOUNT.
NELSON BLOUNT.

Witnesses:

LE ROY F. JONES,
JOHN WILLIAMS.