

(No Model.)

J. E. LARSON.
HYDROCARBON BURNER.

No. 576,272.

Patented Feb. 2, 1897.

Fig:1

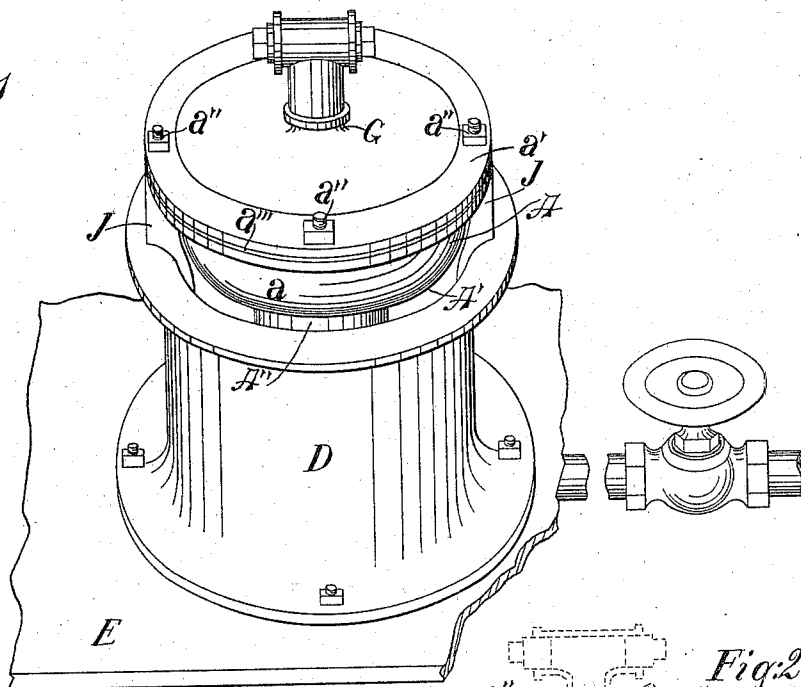


Fig:3

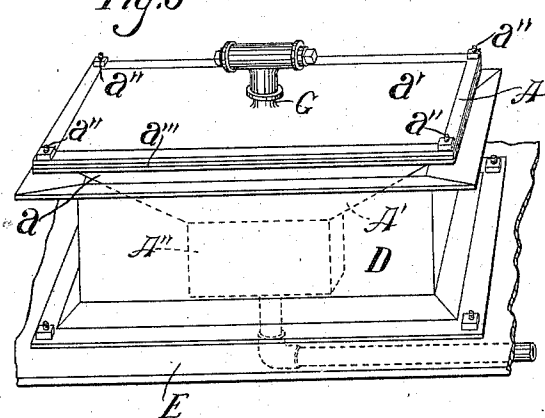
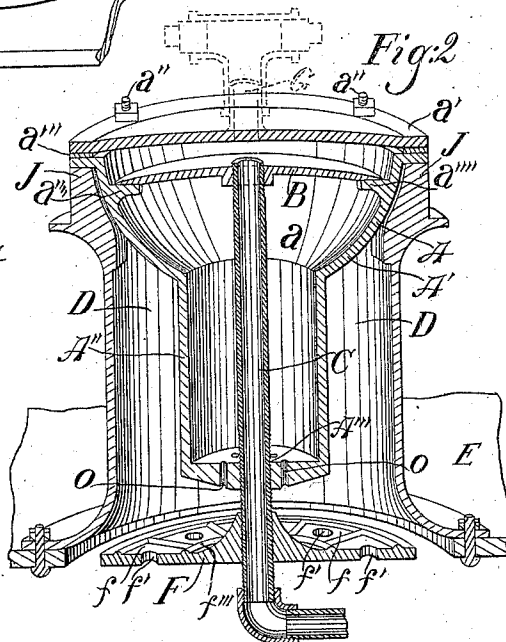


Fig:2



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UNITED STATES PATENT OFFICE.

JOHN E. LARSON, OF LOS ANGELES, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 576,272, dated February 2, 1897.

Application filed February 19, 1896. Serial No. 579,848. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. LARSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention relates particularly to those burners which are designed to burn the oils produced from the distillation of heavy hydrocarbons, and it is more particularly designed to burn a fluid produced from Los Angeles oils and known commercially as "distillate."

My invention is also adapted to burn heavy hydrocarbon oils without the use of steam or compressed air and without clogging.

The object of my invention is to produce a hydrocarbon-burner which will be extremely compact, but will possess a volatilizing capacity greatly in excess of any burner of corresponding size heretofore produced.

A further object of my invention is to produce a burner of this character in which the supply of air may be so regulated as to cause perfect combustion of the fuel, to thereby avoid any smoke or disagreeable odors.

A further object of my invention is to produce a burner which will be extremely simple in construction, easy to manufacture, and will be so arranged that it may be quickly and easily cleaned.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective side elevation of a burner embodying my invention. Fig. 2 is vertical sectional view of the same. Fig. 3 is a perspective plan view of a rectangular burner constructed according to my invention.

In the drawings, A represents the retort, which is preferably composed of a hemispherical portion *a* and a cap *a'*, which is secured upon the top of said portion by means of bolts *a''*.

a''' is an asbestos packing to make the joint tight.

By making the retort hemispherical the bottom *A'* of the retort is made sloping from all sides toward the center, and at the center I provide a well *A''*, having at the bottom suit-

able outlets O, arranged to allow the escape from the retort of the volatilized oil.

In order to feed the oil evenly upon the upper portion of the inclined bottom of the retort, I provide an imperforate spreader-plate B, which is arranged in the retort-chamber and preferably has its top sloping outward from the center toward the outer wall of the retort. This plate is smaller in diameter than the retort-chamber, and is retained in position by means of lugs *a'''*, which may be cast upon the side walls of the retort or upon the spreader-plate, as may be deemed preferable.

C is a supply-pipe arranged to feed hydrocarbon oil upon the center of the spreader-plate. As shown, this supply-pipe is screw-threaded at its lower end and is screwed downward through a screw-threaded opening *A'''*, provided in the bottom of the well, so that such pipe, which is smaller in diameter than the well, is chambered in the well and projects downward below the bottom thereof.

When the retort is made hemispherical in shape, as shown, the top end of the feed-pipe may be screw-threaded and the spreader-plate B screwed upon such top end. The oil which is fed through the pipe is discharged upon the center of the plate and spreads quickly and evenly over the plate, and when a medium heat only is needed this plate will volatilize sufficient oil to run the burner. In case a very great heat is desired the excess of oil flows off of the plate and drips upon the upper portion of the inclined bottom of the retort, along which it flows until the oil is all volatilized, when, in the form of gas, it passes into the well and out of the discharge-openings O.

In order to confine the flame and to cause the retort to be intensely heated, I provide a flue D, which is open at the top and bottom and surrounds the well and the lower portion of the retort, thus compelling the flame discharged from the bottom of the well to pass upward between the flue and the retort. In order to more effectually confine the flame, I secure the flue D to a base-plate E, which, when the burner is to be arranged in a stove, is of a size sufficient to completely fill the fire-box of the stove and to thus compel all the air which passes through the stove to first

pass through between the flue and the retort. This causes a large supply of oxygen to be fed to the burner and perfect combustion is thereby secured.

5 In order to perfectly regulate the supply of air which passes through the flue, I provide a draft and drip plate F, which, for convenience, I screw upon the projecting screw-threaded lower end of the feed-pipe C. This
10 draft-plate is sufficiently large to almost completely close the bottom end of the flue, and by screwing it up and down upon the screw-threaded end of the pipe I can regulate the opening between the edge of the draft-plate
15 and the bottom wall of the flue, and thus control the supply of air admitted to the burner. This plate also serves to receive the gas discharged from the outlets O and to spread the gas and cause it to more thoroughly
20 commingle with the air. It also serves as a drip-cup to receive any oil which may not be volatilized in the retort, and by reason of the flame being directed against the plate it becomes highly heated and the excess oil is
25 quickly volatilized. This plate may be provided with small pits or pockets f and several openings f' provided, extending through the plate, to allow the admission of air through the plate, which serves as an initial burner
30 when the burner is being set into operation. The burner is set into operation by turning oil through the burner until it fills the ring f''' , and when the oil is lighted the air passes up through the openings f' in the pockets
35 and gives perfect combustion of the oil and an intense heat, which heats the retort much quicker than is possible where the drip-cup is not provided with the air-holes.

In the drawings I have shown the retort
40 provided at its top with a nipple G, to which the feed-pipe C may be secured and thus arranged to feed oil through the top of the retort upon the center of the spreader-plate. In case of such an arrangement the pipe passing
45 through the well-hole will be omitted and the spreader-plate will have no opening through its center, as shown in the drawings. This will be readily understood by those
50 versed in the art and does not require illustration. This spreader-plate is reversible and has one side arranged sloping from the center to the circumference and its other side arranged cup shape or sloping from its circumference to the center. Thus, when desired,
55 the spreader-plate may be arranged as shown in Fig. 2, and when oil is fed there-upon it will flow in an even sheet downward therealong, becoming partially volatilized in its passage, and when it drips from the edge
60 of the spreader-plate upon the inclined bottom of the retort the remainder of the oil is very quickly volatilized and passes in the form of gas or vapor down through the well and out of the discharge-opening. If desired,
65 the spreader-plate may be inverted, and in this case the oil will flow over the edges of the spreader-plate, follow down the bottom

or under face of the plate, and will be volatilized by the heat radiating from the walls of the retort. In case distillate is used any
70 impurities or residuum which may be in the oil will remain in the cup of the spreader-plate and will not pass down into the well-chamber, whereby the discharge-openings
75 might, after long use, become partially clogged. By inverting the spreader-plate, as just described, the discharge-openings O may be made smaller than is advisable when the plate is used as shown in Fig. 1, but the capacity of the burner will not be nearly so
80 great as when the plate is arranged as shown in Fig. 2, for the reason that the volatilizing-surface is much less.

In Figs. 1 and 2 I have shown flanges J cast upon the outer wall of the retort and arranged to obstruct the flue of the burner and
85 to thereby divide the burning fuel into two sheets of flame, which are thus directed outward from the sides of the burner. This construction is employed when the burner is
90 used in cooking-stoves and throws the heat out to the sides of the stove, where it is most needed. For heating-stoves the flue may be unobstructed and the flame discharged in an
95 annular sheet.

In Fig. 3 I have shown an angular burner, and it is to be understood that my claims are not limited to any particular shape or size of burner, but cover any style of device in which
100 my invention may be utilized.

The draft-plate F is arranged in the path of the gas discharged from the outlets O, and in its most perfect form has its central part cone-shaped or flaring downwardly and outwardly, and the pits or pockets f are arranged
105 in an annular ring around the outer portion of the plate. The perforations f' are provided in the row of pockets, so that the flame of the burning gas is spread by the cone-shaped central portion of the plate, and the air passing
110 through the perforations f' in the plate is directed into the spread sheet of flame, and intense heat and perfect combustion are thereby secured.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hydrocarbon-burner, the combination of a retort having its bottom inclined toward the center and having a centrally-
120 arranged well provided with an outlet; an imperforate spreader-plate arranged in the chamber of the retort to spread the hydrocarbon and deliver it upon the inclined bottom of the retort; and means for feeding hydrocarbon upon
125 the spreader-plate.

2. In a hydrocarbon-burner, a retort provided with an outlet and having its bottom inclined from all sides toward the center; a spreader-plate arranged above the bottom of
130 the retort and sloping from its center outward; and means for feeding hydrocarbon upon the center of the spreader-plate.

3. In a hydrocarbon-burner, the combina-

tion of a retort having its bottom sloping toward the center, and provided with a centrally-arranged well having outlets; a spreader-plate arranged in the chamber of the retort; a feed-pipe passing through the well and upward through the spreader-plate; and a cap arranged to form the top of the retort.

4. In a hydrocarbon-burner, the combination of a retort provided with a sloping bottom and a centrally-arranged well; a spreader-plate situated in the retort and adapted to spread hydrocarbon upon the sloping bottom thereof; a feed-pipe passing through the well and the spreader-plate; a flue surrounding the well and open at top and bottom; and a draft-plate secured upon the feed-pipe and arranged to regulate the air admitted to the flue.

5. In a hydrocarbon-burner, the combination set forth of a retort-base having its bottom sloping from all sides toward the center, and provided with a central well and discharge-openings leading therefrom; a feed-pipe screwed through the bottom of the well, passing up through the well and having its top screw-threaded; a spreader-plate screwed upon the top of the feed-pipe; a cap secured to the body of the retort to form the top thereof; a flue surrounding the well and the bottom of the retort and flaring outwardly at top and bottom; and a draft-plate arranged upon the feed-pipe below the bottom of the well and adapted to screw therealong to regulate the admission of air into the flue.

6. In a hydrocarbon-burner, the combination set forth of a retort having its bottom sloping from all sides toward the center, and provided with a centrally-arranged well and discharge-openings; a spreader-plate situated in the chamber of the retort and sloping from the center outward; means for feeding hydrocarbon upon the center of the spreader-plate; a cap arranged to form the top of the retort; and a flue, open at top and bottom and surrounding the well and the bottom of the retort.

7. In a hydrocarbon-burner, the combination set forth of a hemispherical retort pro-

vided at its bottom with a well having the openings leading therefrom; a spreader-plate arranged in the chamber of the retort; means for feeding hydrocarbon upon the spreader-plate; and a flue, open at top and bottom and surrounding the well and the bottom of the retort.

8. In a hydrocarbon-burner, the combination set forth of a retort having an outlet; and a reversible spreader-plate having one side sloping from the center outward, and its otherside sloping from the outside to the center, and means for feeding hydrocarbon oil upon the spreader-plate, as and for the purpose set forth.

9. In a hydrocarbon-burner having downwardly-discharging outlets, an initial-burner plate arranged in the path of the flame discharged from the outlets and having its center portion flaring downwardly and outwardly and its outer portion provided with pits or pockets and draft-openings passing through the plate.

10. A hydrocarbon-burner comprising a retort having its bottom sloping toward the center, and a vaporizing and spreading plate arranged in the chamber and having its upper face sloping from its center to its circumference to spread the oil and to deliver it upon the upper portion of the sloping bottom of the retort; and a pipe arranged to feed oil upon the center of the plate.

11. In a hydrocarbon-burner, the combination set forth of a retort having downwardly-discharging outlets; a spreader-plate situated in the retort; means for feeding hydrocarbon upon the spreader-plate; a flue surrounding the retort; an initial-burner plate arranged in the path of the flame discharged from the outlets and having its center portion flaring downwardly and outwardly and its outer portion provided with pits or pockets, and draft-openings passing through the plate.

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Witnesses:

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