

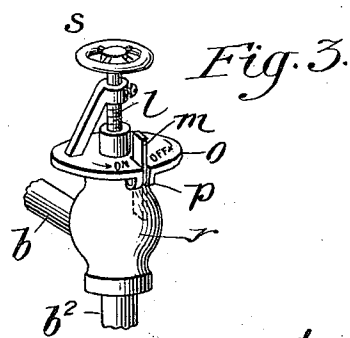
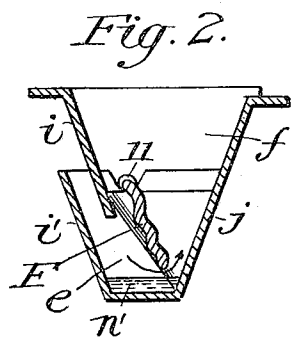
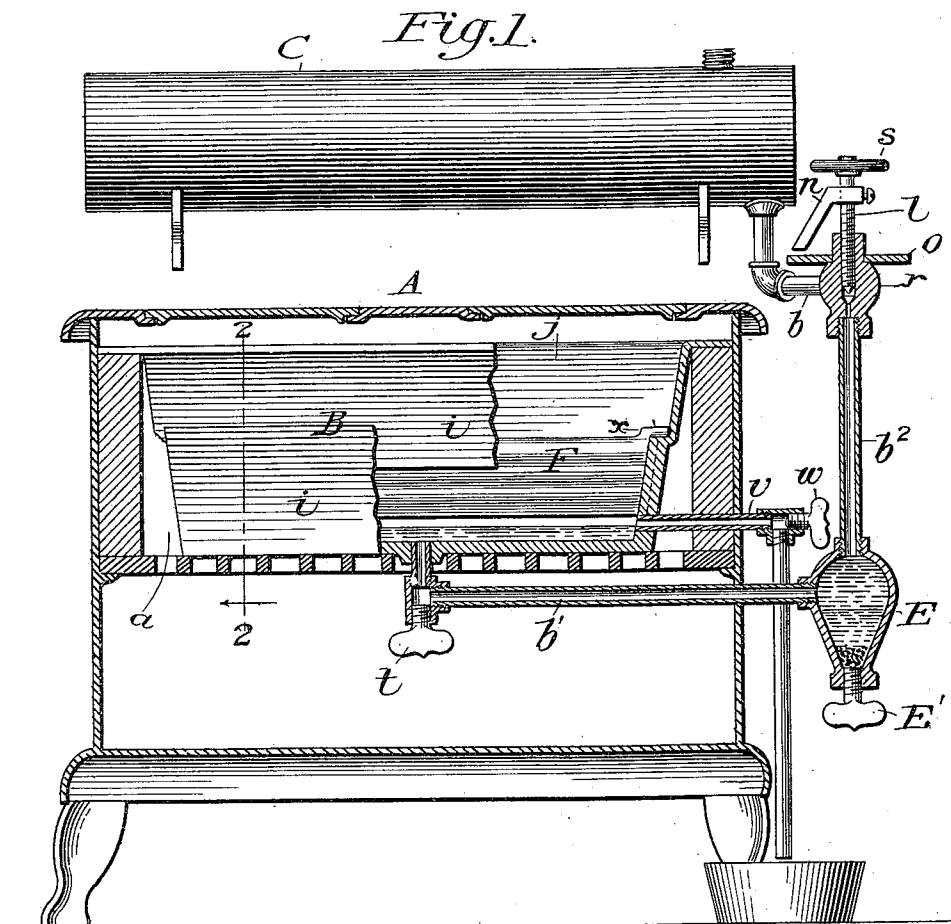
No. 670,326.

Patented Mar. 19, 1901.

J. F. C. MULLEN.
HYDROCARBON BURNER.

(Application filed July 7, 1900.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN F. C. MULLEN, OF CINCINNATI, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 670,326, dated March 19, 1901.

Application filed July 7, 1900. Serial No. 22,853. (No model.)

To all whom it may concern.

Be it known that I, JOHN F. C. MULLEN, a citizen of the United States, residing at Cincinnati, county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is designed to provide means for the more perfect and practical combustion of hydrocarbon oils directly—i. e., without the employment of preliminary spraying or vaporizing devices and also without the use of wicks and other capillary conveyers for the oil—all as hereinafter described, and particularly set forth in the claims, forming a part of this specification.

In the accompanying drawings, Figure 1 is a vertical section through the fire-box of a stove or range provided with my improved burner, the front walls of the burner being shown as partly broken away and the feeding device being shown in section. Fig. 2 is a sectional view taken on a plan indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is a detail in perspective of the valve for regulating the flow of oil from the reservoir.

Preliminary to a more detailed description it may be stated that my improved fire-pot or burner is adapted to fit within the fire-box of an ordinary cooking stove, range, or furnace and that the reservoir for the oil is located, preferably, at the rear end of the stove and at a suitable height or elevation to cause the oil to flow to the burner through a connecting supply-pipe. The supply-pipe is located outside of the stove and is provided with a regulating feed-valve, and a chamber is also located in said pipe between said valve and the burner for collecting any sediment or water which may be present in the oil and for discharging said sediment or water when desired and also for a more important purpose hereinafter described.

The fire-pot or burner itself is so constructed and arranged that the air entering the fire-box of the stove through the ordinary channels therefor is deflected downwardly through the forward portion of the burner and thence

inwardly across the surface of the oil, where it mixes with the oil-vapor, the resultant flame issuing upwardly and being deflected against the opposite wall of the fire-pot or burner in such manner as to spread and completely fill the space inclosed by the surrounding parts.

Reference being had to the drawings, A represents an ordinary cooking stove or range, in the fire-box *a* of which is arranged my improved fire-pot or burner B, the said burner receiving its supply of hydrocarbon oil through a supply-pipe *b*, connecting the burner with an oil-reservoir C. The said reservoir C will be located in an elevated position, preferably at the rear of the stove, and fastened to the back thereof, although for convenience of illustration I have shown it in the drawings as slightly elevated, so as to avoid obscuring the pipe *b*. The pipe *b* enters a fitting *r*, provided with a needle-valve, whose stem *l* is provided with an operating-handle *s* and has a long threaded portion, as shown, to avoid necessity of packing. The stem is provided with a finger *n*, secured thereto by a set-screw, to permit of adjustment. Attached to the valve body or fitting *r* is a disk *o*, having a radial slot *p*, with lugs below, on either side of the slot, to which a stop-plate *m* is hung, so as to project upwardly into the position shown in full lines when serving as a stop for the finger *n* or to depend down out of the way when it is desired to remove the stem *l* by unscrewing it. The stop will be so adjusted on the stem that when the finger *n* is turned toward the right to the limit of its movement in that direction the valve will be closed and when turned to the left to the opposite limit of its movement the valve will have the maximum opening intended. With the stop as a guide the operator can obtain any desired opening between these extremes.

From the valve *r* depends the pipe-section *b*², which discharges into a chamber E, serving to collect any sediment that may be present in the oil and allow of its discharge by removing the plug E' and also forming a head or reservoir of oil for an important purpose. Thus I have found that in burners of this general character frequent stoppages of the oil-

supply take place, due perhaps to the formation of a vacuum in the supply-pipe by reason of the burning at times of the oil in the burner faster than the oil was being fed through the valve or perhaps from a sudden generation of gas in the burner and a back pressure of air or gas in the supply-pipe. Whatever the cause, however, I find that the difficulty is avoided by providing the feed-reservoir E.

I also find that whatever water there may be in the crude oil collects at the bottom of the chamber E by gravity, whereupon by closing the valve *l* above and removing the plug below I can drain off the water.

The pipe *b'* from the reservoir E discharges through the bottom of the burner at approximately the center thereof through the intermediacy of a short upward branch having a removable screw-threaded plug *t* in direct alinement with the vertical pipe, thereby allowing direct access in cleaning out the latter when the plug is removed.

To prevent more than just the required amount of oil from being introduced into the burner, I provide an overflow-pipe *v*, which discharges into a pan, placed below the stove. Should the operator open the needle-valve too wide, the oil will begin to drip into the pan, and upon hearing this the operator will know that the valve must be closed somewhat. A removable screw-plug *w* is likewise provided to facilitate the cleaning of the pipe *v* should the latter become obstructed.

The fire-pot or burner comprises a hollow box-like structure frusto-pyramidal in form, having downwardly and inwardly inclined sides terminating in an integral bottom. One wall of the fire-pot is constructed of two overlapping parts *i i'*, the former being set in or occupying a different plane from the latter, so as to form a longitudinal passage extending all the way across the burner. The lower edge of the part *i* extends downwardly some distance beyond the upper edge of the part *i'*, as shown, thereby constituting a deflector for the entering air and directing the same downward and across the surface of the oil. A flame-deflector F, having lateral lugs *x*, is mounted in notches or recesses *x'*, formed in the ends of the fire-pot, and said flame-deflector normally rests against inclined shoulders *y*, projecting inwardly from the ends of the fire-pot, as shown in Fig. 2. The fire-pot is thereby provided with an initial mixing and combustion chamber *e* and a main combustion-chamber *f*, the admixture of the air with the oil-vapor taking place in the lower part of the burner, while combustion takes place principally in the upper part of the burner. By means of the deflector F the flame produced by the ignition of the vapor is deflected against the wall *j* of the burner and finally spreads in increased volume within the upper main combustion-chamber *f* of said burner.

The fire-pot or burner is mounted in the

stove and secured in position by means of lateral flanges *g*, extending around the sides of said fire-pot and resting on the top edge of the fire-brick, as indicated in Fig. 1.

In placing the burner within the stove care must of course be taken to cement it in place air-tight with respect thereto, so as to insure that all the air entering shall pass through the burner by way of the inlet or intake passage thereof.

The operation is as follows: To operate the burner, the valve in the supply-pipe is opened, causing the crude petroleum or fuel-oil employed to flow upwardly into the burner until the bottom of the burner is barely covered with the oil. The oil is then ignited in any suitable manner—as, for instance, either by inserting a paper lighter or an asbestos lighter through the front opening of the burner or by lifting the deflector-plate F for the purpose of inserting such lighter after raising the stove-lid. While the oil in the bottom of fire-pot is being consumed fresh oil is being supplied continuously by the upward feed through the open end of branch supply-pipe *b'*, the feed-opening being thus sealed from both air and flame and a continuous combustion resulting without carbonization and without clogging any of the parts of the apparatus.

Although I have described the burner as using oil as a fuel, it must be understood that it is equally well adapted for burning other kinds of fluid-hydrocarbon fuels, such as petroleum-oils or natural or artificial gases.

Having thus described my invention, what I claim is—

1. A hydrocarbon-burner, comprising an open hollow fire-box, provided with lateral flanges, the front wall of said fire-box formed of two overlapping portions to provide an air inlet and deflector, and a pivoted flame-deflector extending transversely of said fire-box.

2. A hydrocarbon-burner, comprising an open hollow fire-box, provided with lateral flanges, the front wall of said fire-box formed of two overlapping portions to provide an air inlet and deflector, and a flame-deflector extending transversely of said box.

3. A hydrocarbon-burner, comprising an open hollow fire-box, provided with lateral flanges along its upper edges, the front wall of said fire-box formed of two overlapping parallel portions to provide an air inlet and deflector, a pivoted flame-deflector extending transversely of said fire-box, and shoulders in the ends of said fire-box against which said flame-deflector rests.

4. A hydrocarbon-burner comprising an open hollow fire-box, provided with lateral flanges along its upper edges, the front wall of said fire-box formed of two overlapping portions to provide an air inlet and deflector, a flame-deflector extending transversely of said fire-box, and shoulders in the ends of said fire-box against which said flame-deflector rests.

5 5. A hydrocarbon-burner, comprising an open hollow fire-box, provided with lateral flanges along its upper edge, the front wall of said fire-box formed of two overlapping portions to provide an air inlet and deflector, a flame-deflector extending transversely of said fire-box and pivoted in recesses in the ends thereof, and shoulders in the ends of

said fire-box against which said flame-deflector rests.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. C. MULLEN.

Witnesses:

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JOHN B. SHERWOOD.