

UNITED STATES PATENT OFFICE.

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VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 654,289, dated July 24, 1900.

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To all whom it may concern:

Be it known that I, ROBERT SEEGER, of the city of St. Paul, county of Ramsey, State of Minnesota, have invented certain new and
5 useful Improvements in Vapor-Burners, of which the following is a specification.

My invention relates to vapor-burners; and one object of my invention is to provide a
10 vapor-burner which will maintain an even steady flame at all times and in all kinds of weather.

A further object of the invention is to provide a vapor-burner which will contain a minimum amount of metal, so that the burner
15 may be easily heated and kept at the required high temperature which is necessary to rapidly vaporize the oil fed thereto.

A further object of the invention is to provide a burner which may be easily and quickly
20 cleaned; and a further object is to utilize the heat of the illuminating-flame as a means to vaporize the oil.

My invention consists generally of a vapor-burner of the construction and combination
25 of parts hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and
30 in which—

Figure 1 is a side view of a burner embodying my invention. Fig. 2 is a front view thereof. Fig. 3 is a plan view of the same. Fig. 4
35 is a side view of the burner with the lower portion thereof in section, showing the interior construction of the burner. Fig. 5 is a vertical section of the burner, showing a slightly-modified construction. Fig. 6 is a plan view similar to Fig. 3, showing the tip
40 in a different position.

As shown in the drawings, the burner comprises the straight vertical tube 2, adapted to receive the removable tip 3 in its upper end. This tip sets into a socket 4, which is of a size
45 to leave an annular space around the tip. The tip is provided with a jet-slot 5, and also has two small holes 6, which holes are beneath the top 7 of the tube-socket 4, so that they deliver the gas into the annular space around
50 the lower part of the tip. In the lower part of the burner-tube are air-openings 8, pref-

erably transverse saw-cuts. In the bottom of the tube is a partition 9, the top of which is finished to a cone shape by a tool inserted through the upper end of the tube before the
55 tip is placed therein. Beneath the partition 9 is a chamber 10, from which vapor is forced into the bottom of the tube through a small central jet-hole 11 in the partition 9. 12 is a vertical web projecting from the side of the
60 tube and having an integral stud 13 on its rear edge to receive and hold the shield 14, which is secured thereon by a nut 15. 16 is a retort-chamber or barrel formed integrally with the burner-tube and the web 12 and hav-
65 ing an open top. The top of the chamber is closed by a dome-cap 17, which is screwed onto the top of the retort-chamber and completes the same. 18 is a tube which projects upward from the bottom of the retort-cham-
70 ber through the tube and downward through the duct 19, which is made in the web. As shown in Fig. 1, the web is preferably enlarged to allow the boring of the duct 19, which duct, it will be noticed, is concentric with the
75 tube 18 and with the retort-chamber. All of such parts are arranged at an acute angle with respect to the vertical burner-tube 2. A horizontal hole 20 is drilled in the bottom of the burner and communicates with the duct
80 19, whereby said duct 19 and the retort are connected with the chamber 10 in the lower part of the burner-tube.

The gasolene is led into the retort-chamber in any suitable manner. In some burners I
85 make the inlet-nipple, to which the oil-pipe is connected, at the lower part of the burner, as shown in Figs. 1, 4, and 5, while in others I prefer to place the inlet at the top of the burner and on the back of the retort, as shown
90 by dotted lines in Fig. 1. The lower inlet (shown in full lines) is connected with the retort by the vertical duct 21, made by drilling downward in the web from the retort-chamber 16 before the cap or dome 17 is fitted
95 thereto.

To facilitate the cleaning of the jet-hole 11 in the lower part of the burner-tube, the lower end of the chamber 10 is closed by an easily-removable cap or cup 22. The cup and the
100 lower end 23 of the burner-tube are provided with conical surfaces, so that the cup fits

neatly upon the end 23, making a gas-tight joint therewith. The cup is held in place and is snugly drawn upon the end 23 by means of an arm 24, provided upon the cup and adapted to engage a lug upon the front or side of the burner. In Figs. 1, 2, and 4 I have shown an integral lug 25 upon the lower end of the burner-tube, said lug having an inclined upper surface 26, adapted to be engaged by the arm 24 upon the cup or cap 22, so that when the cap is turned the same will be forced upward upon the conical end 23 of the tube or, vice versa, will be released from the lug, so that the cap may be taken off. The cap is provided with wings 27, to be grasped in turning the cap. In place of the integral lug 25 I may use the pin or screw 28, (see Fig. 5,) said screw filling the hole made in the tube when drilling the hole 20, which latter communicates with the duct 19. In this case the arm 24 will be provided with an inclined or wedge surface to bind upon the top of the pin or screw 28. To clean out the lower part of the vapor-duct leading from the retort, as shown in Fig. 5, the pin 28 is first removed and a wire or suitable tool is then inserted into the ducts 20 and 19. A somewhat simpler construction of the ducts and one which permits the use of the integral lug 25 is shown in Fig. 4, where the lower branch 20' of the duct 19 is made by drilling a hole concentric with the inlet-nipple 21'. The flow of oil from the nipple direct to the chamber 10 is cut off by a plug or screw 29, that is driven into the outer end of the transverse duct 20'. This plug is preferably made to be easily removed, so that wire may be inserted to clean out any carbon or other substance accumulating in the ducts. The bottom 30 of the retort-chamber projects upon opposite sides of the integral web 12 and is inclined with respect to the burner-tube, and in the tube and upon opposite sides of the web are the small jet-holes 31. Small jets of gas will be forced from these holes, and being ignited will maintain flames beneath the bottom of the retort and around the sides thereof, making the retort hot, as required to thoroughly vaporize the gasoline as it is fed into the retort-chamber. The heating-jets from the holes 31 are projected by the right-angled shield 14 and by the wings 32, projecting from the sides of the burner-tube. Furthermore, to prevent an upward draft of air within the shield I preferably provide a horizontal floor 33, which closes the bottom of the shield and is integral with the other parts of the burner. The shield is removable in order that the jet-holes 31 may be drilled and in order that the same may be easily cleaned at any time. As above stated, the tip 3 is removable, so that its slot and flame may be adjusted at any desired angle.

It is well known that in cold weather most gasoline-burners furnish a flame of much less candle-power than that furnished by the same burners in warm weather. This is owing to

the fact that a certain provision is made for heating the burner and is not changed at any time. In the present burner I may regulate the heating of the retort by adjusting the tip so that the flame will more or less closely approach the upper part of the retort which projects above the tip, or, if necessary, the flame may be made to impinge directly upon the cap of the retort. This feature I believe to be one of the most important features of my invention. One of the essential features and advantages of the burner herein described is the lightness and compactness thereof, the same containing little metal to be heated and having its parts so closely arranged that they are easily kept hot, comparatively little surface being exposed at any considerable distance from the heating-jets and illuminating-flame. A further advantage lies in the straight ducts of the device and in the few angles therein, all parts being easily accessible. The small jets from the holes 6 are directed upward from the annular space and tend to greatly strengthen the flame, the same being less affected by a wind or draft. These holes are opposite one another at right angles to the slot in the tip.

I am aware that removable tips have been used upon a number of vapor-burners and that tips of exactly the construction herein illustrated have been so employed, but I believe that the employment of a tip in close proximity to the retort and so arranged that the illuminating-flame will aid in heating the retort is entirely new in this art.

A further advantage of my invention lies in the easily-removable cap for the lower end of the burner-tube, the same being small and light, so that little metal is added to the burner and whereby the vapor-jet is made easy to clean.

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

1. The combination, in a vapor-burner, of a burner-tube, with a tip, adjustable with respect thereto, of the vapor-retort in close proximity to said tip, and said tip being arranged to direct the flame upon or in proximity to said retort, as and for the purpose specified.

2. The combination, of the burner-tube, with the vapor-retort in proximity to the side and upper end of said tube, and the adjustable tip for said tube, whereby the flame may be directed against or in proximity to the said retort or diverted therefrom, substantially as described.

3. The combination, with the burner-tube, of a retort arranged near the upper end of said tube, an adjustable tip provided in said tube whereby the flame may be directed against or in proximity to said retort, a duct leading from said retort and communicating with the interior of said tube, an oil-inlet opening communicating with said retort, and jet-openings provided in the walls

of said tube beneath said retort, and whereby independent heating-flames may be formed, for the purpose specified.

4. The combination, in a vapor-burner, of the burner-tube and a tip, with a vapor-jet in the lower part of said burner-tube, an intermediate air opening or openings, means for supplying vapor to the lower part of said tube, and a cap or cup having a smooth interior surface to fit the smooth lower end of said tube and being therefore easily removable therefrom, and means for locking said cap upon said tube, substantially as described.

5. In a vapor-burner, the burner-tube having a tapered lower end and provided in its lower part with a jet-opening and an air-opening, in combination, with the tapered cap or cup fitting said tapered lower end of the tube and closing said lower end, said cap provided with an arm and a lug upon said tube where-with said arm engages to secure the cap in place, substantially as described.

6. In a vapor-burner, the combination, of the burner-tube having the tapered lower end, with the tapered cap fitting said lower end, an arm upon said cap, a lug upon said tube, and said arm or lug having an inclined or wedge surface, as and for the purpose specified.

7. The combination, in a vapor-burner, of the burner-tube provided with jet and air openings and with a tip, with a cap or cup removably fitted upon the lower end of the burner-tube and closing said lower end, and an arm 24 provided on said cap to engage a lug upon said tube, substantially as described.

8. The combination, with a burner-tube, of an integral web thereon, a retort provided in the upper part of said web and near the up-

per end of said tube, an adjustable tip provided in said tube to permit the flame to be directed against or in proximity to said retort and diverted therefrom, a duct leading from said retort and communicating with the interior of said tube, an oil-inlet provided near the discharge end of said duct, a second duct leading from said inlet to said retort, and jet-openings provided in the walls of said tube beneath said retort whereby its lower walls and the walls of said ducts are kept hot, for the purpose specified.

9. The combination, of the burner-tube, with the integral web, the retort provided in the upper part of said web and having its lower portion integral therewith, the duct leading from the upper part of said retort downward through said web to the lower end of said burner-tube, means for heating said retort, and a removable cap or cup upon the lower end of said burner-tube, substantially as described.

10. The combination, with a burner-tube, of a retort arranged at one side and near the top thereof, a duct leading from said retort to a point near the lower part of said tube, an inlet-duct, a cross-duct leading from said inlet-duct and communicating with the lower part of said burner-tube and intersecting the duct leading from said retort, a plug normally closing said cross-duct, and means closing the lower end of said tube, substantially as described.

In testimony whereof I have hereunto set my hand this 23d day of October, A. D. 1897.

ROBERT SEEGER.

In presence of—

C. G. HAWLEY,
M. E. GOOLEY.