No. 618,371. Patented Jan. 24, 1899.

A. A. ARNOTT.

HYDROCARBON BURNER.

(Application filed Oct. 11, 1897.)

(No Model.)

Fig. 1.

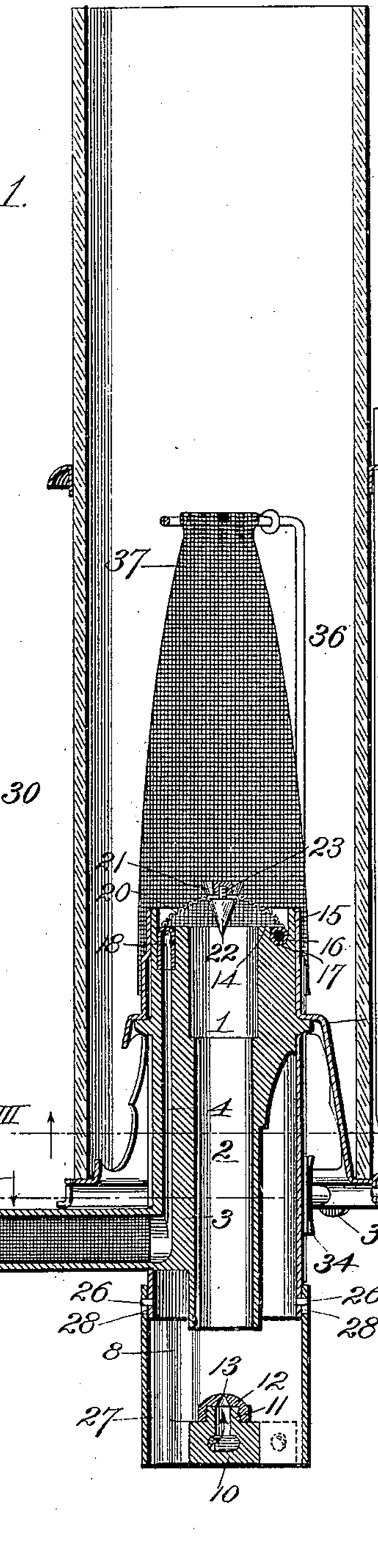


Fig. 2.

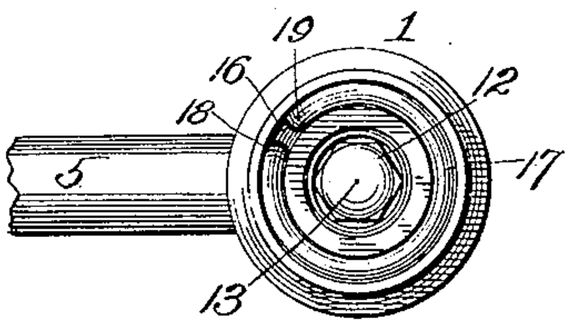


Fig. 4.

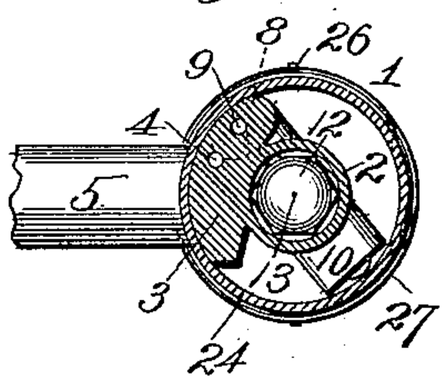


Fig. 3.

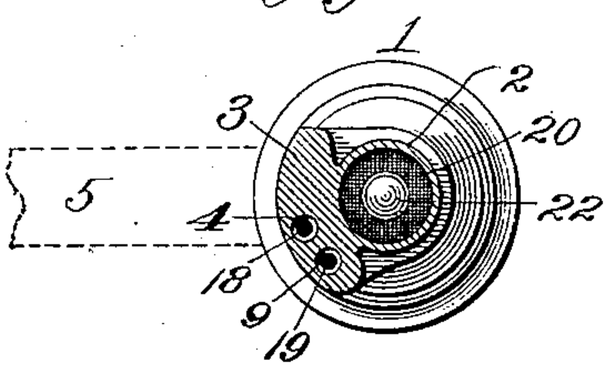
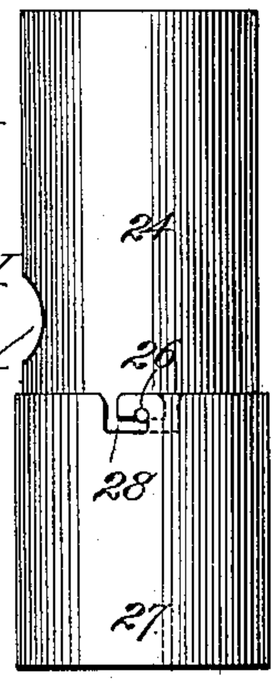


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALFRED A. ARNOTT, OF TOPEKA, KANSAS.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 618,371, dated January 24, 1899.

Application filed October 11, 1897. Serial No. 654,799. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. ARNOTT, of Topeka, Shawnee county, Kansas, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to hydrocarbon-burners; and its objects are, first, to produce a burner of this character in which the supply-tube is cast integral with the burner in order to obviate a joint at the point of connection, which has been found in practice in other burners of this character after a short service to cause the burner to assume a position other than the perpendicular in order to screw it sufficiently tight upon the pipe to prevent leaking, and as this burner ordinarily is provided with a chimney it is obvious that the burner is rendered useless in such connection; second, to produce a cheap and serviceable burner by employing a vaporizing tube or coil which describes almost a circle, but which may be more or less extended—that is to say, may describe a smaller segment of a circle or more than a circle—the segment shown, however, being preferred, as it has been found in practice that it is of sufficient length to fully vaporize the oil passing through it; third, to provide a burner of this character wherein the mixing-chamber tube or extension is cast integral with the burner; fourth, to provide a wire-gauze tube provided with a flame-spreader which extends both above and below the tube; fifth, to provide a removable cap or nozzle through which the gas is discharged up into the mixing-chamber and dispense with valves to control this discharge, it having been found in practice that the valve that is usually located at this point is a useless adjunct and affords simply an extra joint through which the oil or gas may in time leak or escape, and, sixth, to provide a sectional casement of ornamental appearance and serviceable in that it prevents a draft from interfering with the discharge of gas or vapor into the mixing-chamber, and consequently insures a perfect flame whether burning in or out of doors.

With these objects in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed.

In order that the invention may be fully understood, I will proceed to describe it, with reference to the accompanying drawings, in which—

Figure 1 represents in vertical central section a burner constructed in accordance with my invention as used in connection with a mantle of the "Welsbach" type. Fig. 2 is a top plan view of the burner. Fig. 3 is a section of the burner taken on the line III III of Fig. 1. Fig. 4 is a section of the burner taken on the line IV IV of Fig. 1. Fig. 5 is a side view of the burner-casement.

In the said drawings, 1 designates the body portion of the burner. It is of the customary circular form and is provided with the depending mixing-chamber tube 2, which preferably is cast as an integral extension of the body portion, so as to obviate a joint between the two. At one side the body portion is also provided with an extension 3, cast integral with the extension 2, but not reaching from the coil quite to its lower end, preferably, and provided with a vertical passage 4, which communicates with the passage of the supply-pipe 5 at one side of the latter, as shown most clearly by the relative positions of the parts in Figs. 2, 3, and 4 and for a purpose which will be presently explained.

The supply-pipe 5 is cast integral with the burner, as shown clearly in Fig. 1, for a purpose hereinbefore explained, and is provided at its opposite end with threads 6, whereby it may be screwed easily and quickly into the ball-cock 7, this ball-cock being mounted upon a tube leading from the oil-supply, (not shown,) or from the gas-supply if it be desired to use it in connection with manufactured or natural gas.

Cast integral with and depending vertically from the extension 3 is a stem 8, provided with a vertical channel or passage 9, which parallels the passage 4 and continues through the horizontal arm or foot portion 10 of the stem 8, said foot portion projecting radially of the burner. At a point axially below the burner is the vertical continuation (see Fig.

1) of the passage 9, which extends upwardly through the threaded boss 11, cast integral with the arm or foot portion 10, and screwed down upon said boss is a gas cap or nozzle 12, said gas cap or nozzle being formed with a rounded top and hexagonal body (see Figs. 2 and 4) for convenient engagement with a wrench and with a central opening registering with the passage 11, which tapers to the extremely fine orifice 13, through which the gas or vapor is discharged under pressure up into the mixing-chamber, so as to draw with it therein air in sufficient quantity to insure a perfect combustion at the burner-cap.

If desired, instead of employing the cap 12 I may drill up through the bottom of the arm or foot portion 10, so as to provide the boss 11 with a gas-discharge orifice, and in this case said boss should not be threaded, of course.

The opening of the burner at its upper end is enlarged, so as to provide the annular horizontal shoulder 14 and the thin encircling flange or wall 15. The shoulder 14 is rimmed out, so as to provide the circular groove 16, in which is welded or otherwise secured the pipe or coil 17, the ends of which are very close together, so as to complete a circle as nearly as possible, and depend vertically downward, the end 18 communicating with the upper end of the passage 4 and the end 19 communicating with the upper end of the passage 9. In this coil the oil is completely vaporized. As above stated, this coil may describe a smaller segment of the same circle or one may be caused to lap the other one or more times; but in practice I prefer the construction shown, as it has been demonstrated that the oil is always thoroughly vaporized by the time it reaches the outlet end 19 of said coil. The shoulder 14 or coil 17 also forms a support for the wire-gauze burner-tip 20, and arranged vertically and centrally of said tip is an inverted conical spreader, which extends both above and below said tube and consists of the upper portion 21 and the lower portion 22, the latter being provided with a threaded stem 23, which extends up through the tip and into the upper portion 21. This spreader thoroughly and effectually deflects the flame of the burner-tube outward, so that it will impinge upon the flange or wall 15, which serves as a quick and reliable conductor of heat to the vaporizing-coil in order that the vaporization of the oil may be thorough, as described.

The burner is provided with a cylindrical casement, which at the same time, as hereinbefore stated, serves as an ornament and protector for the burner. This casement or shield consists of an upper member 24, provided with an opening 25 near its lower end to encircle the supply-pipe 5, and oppositely-projecting pins 26. It is also split vertically from the opening 25 through its upper edge, and is of such metal that the split edges may be sprung apart in order that it may be easily and quickly slipped into position around the burner and upon the supply-pipe, and a lower member 27, which is provided with right-angled slots 28 in its upper edges and opposite sides to engage the pins, said pins and slots having what is known as a "bayonet-joint" connection, which can be made or broken easily and quickly. It will thus be seen that the lower member can be moved easily, if necessary, to get at the gas-cap, and may be as easily replaced.

29 designates what is known as the "gallery" or chimney-support. It is of skeleton form and rests upon an external shoulder of the burner in the customary manner, and 30 designates the chimney thereon. The chimney is maintained in the requisite position by means of a series of vertical rods 31, usually three in number, which are secured at their lower ends to the brackets or arms 32, projecting from the gallery, and at their upper ends to the band 33, which encircles the globe at a suitable height.

34 designates a vertical sleeve provided with a set-screw 35, which impinges upon a rod 36, extending adjustably through said sleeve and supporting in the customary manner the mantle 37, (of the Welsbach type,) which under the flame from the burner becomes incandescent and produces a beautiful white light, the lower end of the mantle embracing the upper part of the burner and gallery, as shown.

In practice, when used in connection with hydrocarbon oil, the burner is first heated to a degree sufficient to vaporize the oil, and the latter is then permitted by the proper manipulation of the valve or cock 7 to pass to the burner, and by the time it passes in a thin stream up through the passage 4 and coil 17 it is completely vaporized and passes in the form of a gas down through the passage 9 and is discharged up through the passage 11 and orifice 13 into the mixing-chamber 2, drawing up with it sufficient air to produce a highly-inflammable gas, which as it begins to escape through the burner-tube is ignited and in a moment heats the mantle to incandescence in the customary manner. When the oil-supply is cut off, the flame of the burner is extinguished and the light goes out.

It will be noticed by reference to Figs. 2, 3, and 4 in particular that by causing the passage 4 to intersect the supply-pipe at one side of the latter the companion passage 9 may be formed very close to said passage 4, and consequently the coil 17, having its ends communicating with said passage, describes almost a full circle.

From the above description it will be apparent that I have produced a hydrocarbon-burner which embodies the features of advantage enumerated as desirable in the statement of invention, and it is to be understood, of course, that such changes as fall fairly within the scope of my invention I reserve the right to make.

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

1. A hydrocarbon-burner, provided with a groove and a wall surrounding and projecting above the same, a vaporizing-tube 17, fitting in said groove, a passage communicating with the oil-supply and one end of the vaporizing-tube, a mixing-chamber surrounded by said groove, a vapor-passage connected to the opposite end of said tube and arranged to discharge oil into the mixing-chamber, and a burner-cap surrounded by said wall and resting upon said tube, substantially as described.

2. A hydrocarbon-burner, provided with a shield or casement consisting of an upper portion clasped around the burner and the lower portion detachably connected to the upper portion, and encircling the lower end of the mixing-chamber, and the vapor-jet orifice of the burner, substantially as described.

3. A hydrocarbon-burner, provided with an integrally-formed mixing-chamber and supply-pipe, a vaporizing-coil, a passage connected with the vaporizing-coil and supply-pipe, a stem having a passage connected to the other end of the vaporizing-coil and provided with a foot portion through which said passage extends, a vapor-jet-orifice cap upon said foot portion, a burner-tip provided with a flame deflector or spreader extending above and below the tip, a gallery upon the burner, a mantle embracing the upper end of the burner and gallery, a chimney upon the gallery, and rods maintaining the chimney in position, substantially as described.

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

ALFRED A. ARNOTT.

Witnesses:
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