H. WELLINGTON.
Vapor-Burner.

No. 214,333. Patented April 15, 1879.

Fig. 1.

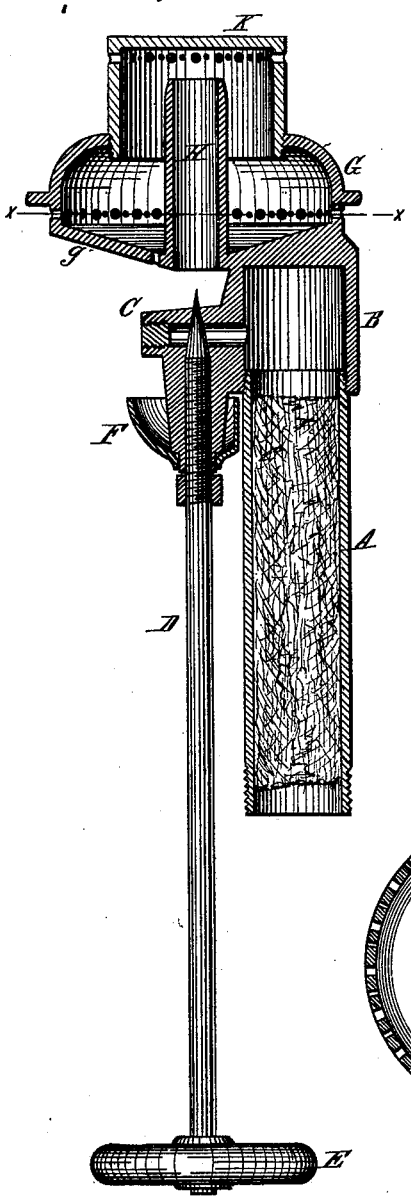


Fig. 2.

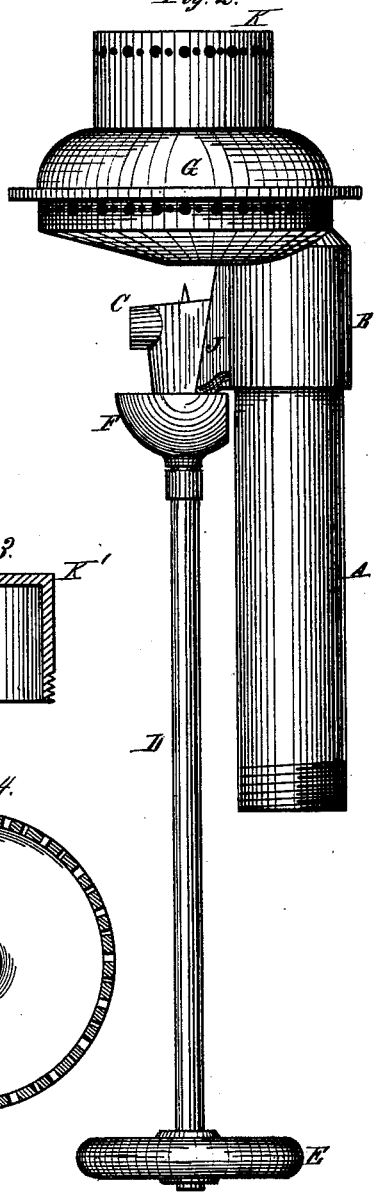


Fig. 3.

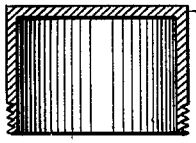
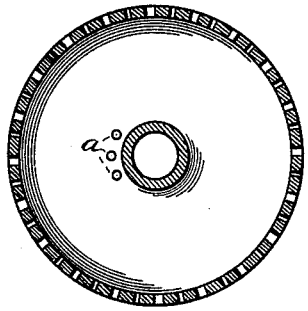


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY WELLINGTON, OF GREEN POINT, NEW YORK.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **214,333**, dated April 15, 1879; application filed March 3, 1879.

To all whom it may concern:

Be it known that I, HENRY WELLINGTON, of Green Point, county of Kings, and State of New York, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is an axial section of my improved vapor-burner, and Fig. 2 a side elevation thereof. Fig. 3 is an elevation of a detached top piece made with imperforate walls; and Fig. 4 is a horizontal section at line *x x* of Fig. 1, showing the location of drip-orifices in the base of the expansion-chamber.

Like letters in all the figures indicate corresponding parts.

My improvements have special relation to that class of burners wherein the gas is generated at or near the point of combustion, and now ordinarily denominated "vapor-burners," and particularly to that species of vapor-burners intended for heating purposes, as for cooking and the like.

The invention consists essentially in certain novel and useful combinations or arrangements of parts calculated to increase the efficiency of the burner as a heater, simplify and improve the general construction, render the burner comparatively noiseless, and to better adapt it for general household use than are the most prominent burners of its class.

The particular arrangements, constructions, and combinations adopted for the purpose of accomplishing these objects will be hereinafter first fully described, and then pointed out in the claims.

B is the socket of the burner, screw-threaded to receive the packing-tube A, which receives its supply of oil or fluid from an elevated tank connected therewith after any approved manner, and under any approved arrangement of conducting-pipes—as, for instance, such as are shown in many of the well-known gasoline-stoves.

The socket B, as will be observed, is cast with and made a part of the base of the expansion-chamber, a comparatively thick connecting-wall being located between the two for the purpose of better conducting the heat from the flame to the generating-chamber, which latter chamber is, in this case, the upper part of the socket B. Upon one side of socket B, and cast therewith, is an enlargement, C, which affords the valve-seat and the screw-threaded branch necessary for supporting the upper part of the valve-stem. In order to connect the valve-seat, which is in fact the jet-orifice for the generated gas, with the generating-chamber, I drill a narrow opening through from the exterior of the enlargement C to the interior of socket B, and then plug up the outer perforation, as plainly shown in Fig. 1.

The valve-stem D is made sufficiently long to be convenient of access when the burner is properly located in the stove, and it is provided with the ordinary hand-wheel E at bottom.

The screw-threaded socket for the valve-stem is located very near to the socket B, so as to economize the heating properties of the burner at the valve-seat as much as possible, and under this arrangement the drip-cup F is jammed up at one side, so that it will fit in between the lower part of the enlargement and the vertical wall of the packing-tube A when the latter is screwed in place.

The horizontal perforation connecting the valve-seat with the generating-chamber is located at a distance below the top of said chamber, so as to afford a considerable space for generation of the gas, while at the same time the compact or closely-arranged parts are placed as near to each other as convenience of construction will permit.

By casting the valve-seat upon the socket I am enabled to dispense with the necessary fitting of this socket to a cap-piece upon the packing-tube, as shown in one of my previous patents, and also with the necessity of making a guiding-stud for the burner and a separate and distinct valve-seat. Aside from these considerations of cost and difficulty of construction, the improved burner has many advantages over previous styles in the matter of heat-conducting properties, so that in the present form the fluid is converted into vapor for burning more easily, rapidly, and thoroughly than in that class of burners wherein the heat-conductors are made in two or more parts.

G is the wall of the expansion-chamber, also

cast with socket B and with the bottom plate, *g*. From plate *g* rises the central tube, H, open at top and bottom, and cast with or as a part of plate *g*. This tube H is located directly over the gas-jet orifice and centrally with reference to the expansion-chamber, and it forms the mixing-chamber for the air and gas after the well-known manner of operation of vapor-burners wherein a jet of gas induces an inward flow of a current of air. The upper part of wall G is centrally perforated and screw-threaded to receive the cap-piece K, which is in the form of a short tube closed at top, as plainly shown. The tube H projects well up into this cap-piece, forming an annular chamber around about the top of tube H, and a second but greatly-enlarged chamber around its base.

As shown in Fig. 1, the cap K is perforated to form orifices for the emission of gas similar to those in the main part of the burner G. When this burner is lighted the air and gas are thoroughly mixed in tube H, driven forcibly against the top plate of K and into the adjacent chamber, from whence a portion escapes at the upper orifices, and a greater portion expands downwardly, fills chamber G, and escapes at the lower or principal row of perforations. The expansion of the gases is augmented by the heat produced at the region of the upper perforations, and still more augmented by that at the lower and more numerous perforations in the burner; and the two chambers combine to produce a space wherein such gases as are confined may operate as an elastic cushion for the incoming gases, thus insuring a steady and uniform flame; and the heat-conducting properties of the solid parts of the burner, owing to their near relative location and their general arrangement, as well as the material of which they are composed, (cast-brass,) are such as to insure the desired easy and thorough generation of gas, as well as the maintenance of a thorough union of gas and air, by reason of which the best heating qualities of the burner are attainable.

The tube H should be carefully graduated in height to correspond with the height of cap K, as well as the general size of the burner. The distance between its top and the top of cap K for a burner of the size represented in the drawings should be about as shown Fig. 1, and for other burners this distance can only be regulated by experiment, being easily varied by cutting away the extremity of tube H; and to facilitate this cutting it will be observed that tube H is made to project through the circular opening in the top of wall or chamber G. The cutting should cease whenever the burners fail to blow or make that ringing disagreeable sound common to most burners of this class.

The bottom plate, *g*, is inclined downwardly toward its central point, by reason of which inclination any sediment or condensed matter which may find its way into chamber G will settle toward the central point, and may be withdrawn or find an easy outlet through the perforations *a a a*, which are so located as that anything passing therethrough will find its way into the drip-cup F. By this means the chamber G is kept free and clear of sediment or condensed matter, and the drip-cup made to retain such foreign matter, so that the burner is maintained clean and in proper working condition at all times.

For some uses of the burner the upper row of perforations is not desirable—as, for instance, in my improved gasoline-range, wherein one of the burners is employed for heating a coil of water-pipe which surrounds it. For such purposes I provide a cap with solid walls K′, as in Fig. 3. This cap may be made to replace the one indicated in Fig. 1, and its operation and purposes are similar to those of cap K, with the exception that it has no gas-jet orifices.

To further increase the heat-conducting properties of the burner, I cast with the socket B and enlargement C a flange or wing, J, one upon each side of the valve seat. This operates to afford an increased quantity of metal in the region of the perforation leading from the generating-chamber to the gas-orifice, whereby the gas at this point, instead of becoming cooled as it flows from the generating-chamber, is maintained at a high degree of heat. These flanges or wings J serve the further very useful purposes of stiffening the connection between the valve-stem socket and the main part of the burner, by reason of which the valve-seat and its surrounding parts are made more rigid and less likely to yield from undue pressure, and of directing any foreign matters which may be collected thereupon down into the drip-cup.

The burner is, of course, lighted and regulated as are all other burners of its class. When constructed in accordance with the foregoing description its several parts are very simple to construct, are easily accessible for cleaning, not liable to derangement or to get out of order, and may be easily understood, controlled, and operated by any ordinary person. Withal the burner is found, in practice, to give excellent results both as to heating qualities and economy in the consumption of liquid fuel.

The same general principles of construction and operation may be applied to the production of a burner for illuminating purposes, it being observed, as is well known, that a smaller volume of air is required to be induced by the gas-jet, and the orifices in the walls of the expansion-chamber would naturally be made smaller for a lighter than for a heater. It would therefore be only necessary to reduce the scale of parts in order to form the desired illuminator.

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

1. In a vapor-burner, the combination of the annular expansion-chamber and the remova-

ble cap-piece, made hollow and surrounding the upper extremity of the mixing-tube, which extends nearly to its top, forming thereby a secondary expansion-chamber above the first, said cap-piece being made with perforate or imperforate walls, and the whole being arranged substantially as shown and described.

2. In combination with the generating-socket, the enlargement C, cast therewith, and perforated to form the connecting-channel, the valve-seat, and the support for the valve-stem, substantially as shown and described.

3. In a vapor-burner having the generating-socket and the enlargement which supports the valve cast therewith, the stiffening walls or wings J, substantially as and for the purposes set forth.

4. In a vapor-burner, the combination of the chamber G, having the mixing-tube H and socket B cast therewith, and the packing-tube opening directly into socket B, substantially as shown and described.

5. The herein-described vapor-burner, comprising chamber G, cap-piece K, tube H, socket B, enlargement C, and the valve, the several parts being combined, constructed, and arranged, and the whole adapted to operate substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal in the presence of two witnesses.

HENRY WELLINGTON. [L. S.]

Witnesses:
WORTH OSGOOD,
S. W. HOLCOMB.