

(No Model.)

J. A. CHANDLER.
VAPOR BURNER.

No. 497,862.

Patented May 23, 1893.

Fig. 1.

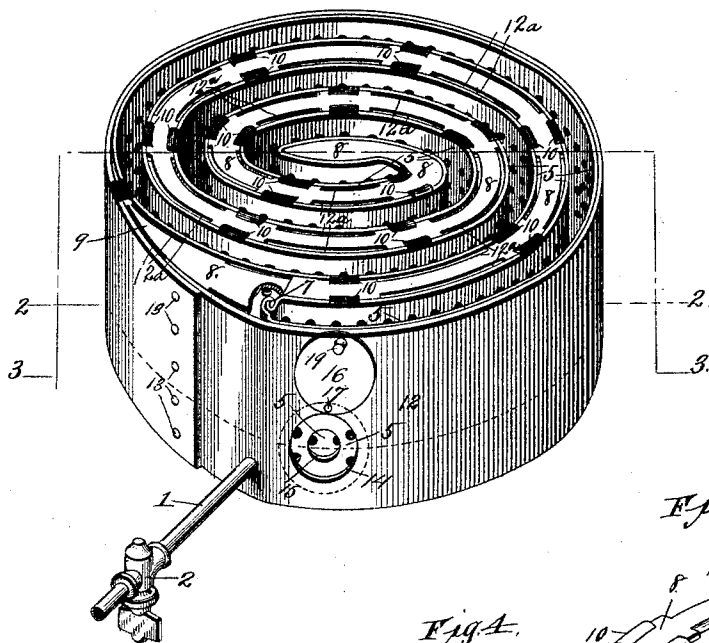


Fig. 2.

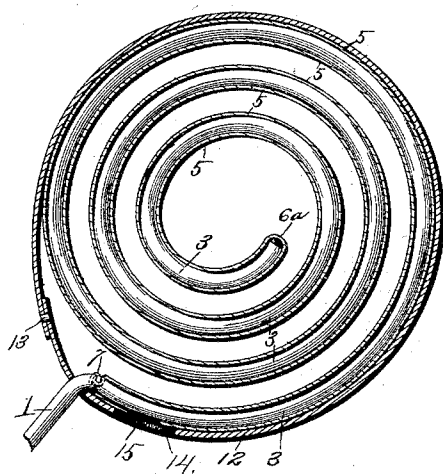


Fig. 4.

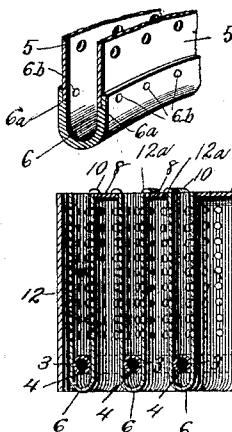


Fig. 5.

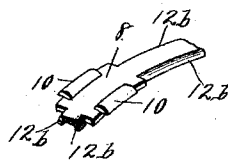
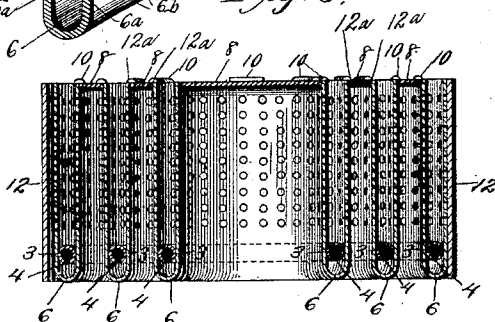


Fig. 3.



Witnesses:

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By

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UNITED STATES PATENT OFFICE.

JOHN A. CHANDLER, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF
TO NELLIE D. WATERS, OF SAME PLACE.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 497,862, dated May 23, 1893.

Application filed April 14, 1892. Serial No. 429,223. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. CHANDLER, of Kansas City, Jackson county, Missouri, 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, forming a part hereof.

My invention relates to that class of burners which are designed to utilize gasoline, and other kindred liquid fuels, and which transform the same into inflammable vapors and consume such vapors for various heating purposes.

The objects of my invention are to produce a vapor-burner which shall be simple, strong, durable, and inexpensive in construction, entirely automatic and continuous in its vaporizing and burning operations, and which shall possess great effective area for combustion, and at the same time be exceedingly compact in its construction; thus adapting the burner for all classes of heaters.

To the above purposes, my invention consists in certain peculiar and novel features of construction and arrangements, as hereinafter described and claimed.

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

Figure 1 is a perspective view of a vapor-burner embodying my invention. Fig. 2 is a horizontal section of the same, on the line 2—2 of Fig. 1. Fig. 3 is a transverse vertical section of the same, on the line 3—3 of Fig. 1. Fig. 4 is a detached sectional perspective view of a portion of the bend or bottom of the burner. Fig. 5 is a detached sectional perspective view of a portion of the spiral top-strip of the burner.

In the said drawings, 1 designates the feed or supply pipe of the burners, this pipe being designed for connection at its outer end to a suitable tank or reservoir (not shown) of any preferred type, and being also provided, at any desired point between the burner and the reservoir, with an inlet and cut off valve 2, also of any suitable or preferred type or

form. At its discharge end, this supply or feed pipe 1 is shown as bent into continuous spiral form, as at 3, there being four coils or convolutions, of this spiral portion of the pipe, shown, but it being intended to increase or decrease the number of such convolutions as desired. In any event, the coils or convolutions of the spiral preferably occupy the same horizontal plane, and are coiled at equal distances from each other, as shown. On its under side the spiral portion 3 of the feed or supply pipe 2 is shown as provided with any suitable number of jet-openings 4, for a purpose to be hereinafter explained, the said openings 4 extending in a continuous longitudinal series throughout the length of the spiral portion 3.

5 designates a continuous spiral casing of foraminous material, such as perforated sheet-metal, or other suitable foraminous material. Each convolution of this casing consists of two equidistant vertical walls the lower margins of which are connected by a horizontal spiral U-shaped bend 6 of non-foraminous material, such as imperforate sheet-metal; the spiral portion 3 of the feed-pipe 1 being located a slight distance above said U-shaped bottom, or bend, as shown. It is to be particularly observed that the continuous spiral foraminous casing 5 is comparatively shallow, as to height or depth; the relative height of the casing, as compared to the vertical diameter of the feed-pipe, being approximately as only about between five and six to one as shown. It is to be also observed that the perforations or foramen of this continuous casing terminate a short distance above the lower margin of the casing, and extend nearly to the upper margin of the same; the purposes of these relative arrangements of parts being hereinafter explained. The inner vertical end of the continuous spiral foraminous casing 5 is closed by a vertical bend 6^a, while the outer vertical bend of said casing is closed by a vertical bend having a vertical lapped joint 7, as shown. The top of the continuous spiral space which intervenes between the space inclosing the convolutions of the feed-pipe, is partially closed by a spiral strip 8 of

imperforate material, such as sheet-metal, or equivalent material, the outer end 9 of this strip being gradually contracted, laterally, as shown at 9, and for a purpose to be presently explained. At intervals throughout its length, the strip 8 is formed with a number of laterally extending lugs 10 the outer ends of which rest upon the upper margin of the spiral casing 5 and thus support the strip 8 in its required position, and intermediate of said lugs 10, the margins 12 of the strips 8 are bent downward to form intermediate air spaces 12^a and pendent segmental flanges 12 which abut against the upper parts of the casing 5 and retain its concentric walls in proper relative position. The burner, as a whole, is inclosed by a circular casing 12, of imperforate material, such as sheet-metal, or the like; the said inclosing casing corresponding in height with the foraminous casing 5, and the feed-pipe 1 extending inward through said inclosing-casing, while the ends of the latter are secured together by a number of rivets 13, or an equivalent joint. The outer end 9 of the strip 8 closes the space between the outer end of the foraminous casing 5 and the inclosing casing 12, and the outer convolution of said foraminous casing. In the lower part of the inclosing casing 12, preferably near the point of ingress of the feed-pipe 1, but permissibly at any other point, is formed a lighting opening or aperture 14, which registers with a similar but preferably smaller lighting aperture 15 which is formed in the corresponding part of the foraminous casing 12; the aperture or opening 14 being closed normally by a drop-lid 16, pivoted to the casing 12, as at 17, and having a knob 19.

Now, when it is desired to light the burner, the inlet-valve 2 is opened for an instant so as to permit a quantity of oil to flow out of the jet-apertures 4 and upon the U-shaped bottom of the foraminous casing 5. The drop-lid 16 is now turned so as to open the lighting apertures 14 and 15, and a lighted match or a flame from any suitable source, is thrust through the lighting apertures and the oil in the bottom 6 of the burner is ignited. The inlet-valve 2 being now opened, the oil in the feed-pipe is vaporized, and as soon as this vaporization is well started, the drop-lid 16 is closed. The vaporized oil in a state of combustion is forced downward through the apertures 4 upon the bottom 6 of the foraminous casing 5, thus completely enveloping the spiral portion 3 of the feed-pipe and insuring continuous and complete vaporization of the oil. Air for supplying combustion enters the open space between each two connected walls of the burner, and owing to the comparative shallowness of said walls, and their foraminous character, the air and oil vapor become thoroughly intermingled immediately above the spiral portion 3 of the pipe and immediately burst into flame; thus materially assisting in the thorough vaporization of the oil. This

comparative shallowness of the foraminous casing also serves to bring the spiral portion 3 of the pipe 1 very closely beneath the surface of the utensil or other structure upon which the flames are to impinge, thus utilizing the maximum heating capacity of the fuel. It will be seen that the entire burner will become highly heated throughout, and consequently that perfect vaporization and at the same time the utmost economical consumption of the fuel will be attained.

It is to be understood that the continuous perforated portion of the feed-pipe may be of elliptical, zig-zag, oval, or rectangular form, without departing from the essential spirit of my invention; the foraminous casing 5 and strip 8, being also of similar form, as well as the inclosing casing 12. It is also to be understood that the jet-opening 4 may be formed upon the upper and lateral sides of the pipe, as well as upon its under sides and without departing from the essential spirit of my invention.

From the above description it will be seen that I have produced a vapor-burner which is simple, durable and inexpensive in construction, and entirely automatic in its vaporizing and burning action, and which is also applicable to a great variety of purposes and effectively utilizes the maximum heating capacity of the fuel while reducing the amount of fuel consumed in any given length of time to the minimum.

It is to be understood that, if preferred, the U-shaped bottom 6 may be formed separately from the foraminous vertical walls 5; the inner sides of the bend 6 being formed with recesses 6^a in which are secured, as by rivets 6^b, or, equivalent means, the lower edges of said foraminous walls 5.

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

1. A vapor burner comprising a coiled perforated supply pipe, a double walled convoluted foraminous strip, inclosing separately each coil or convolution of the pipe, substantially as described.

2. A vapor burner, comprising a coiled perforated supply pipe, a double walled convoluted foraminous strip between each coil of pipe, and a non-foraminous outer casing, substantially as described.

3. A vapor-burner comprising a continuous foraminous casing having equidistant walls arranged in a vertical pair, and having the lower margins of each pair of walls connected by a non-foraminous U-shaped bottom or bend, substantially as set forth.

4. A vapor-burner comprising a continuous foraminous casing composed of vertical equidistant walls arranged in pairs, and a continuous non-foraminous strip having laterally extending marginal lugs, and pendent marginal flanges, and located upon the top of the foraminous casing and over the space between

the combustion-spaces of the burner, substantially as set forth.

5 5. A vapor-burner comprising a continuous convoluted supply-pipe, a continuous convoluted foraminous casing, a continuous non-foraminous casing inclosing the foraminous casing, and a continuous convoluted strip mounted upon the top of the foraminous casing and partly closing the top of the space

between the combustion-spaces of the burner, substantially as set forth. 10

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

JOHN A. CHANDLER.

Witnesses:

H. E. PRICE,
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