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Patented Aug. 28, 1900.

C. J. SEARCH.
VAPOR STOVE.

(No Model.)

(Application filed Feb. 27, 1900.)

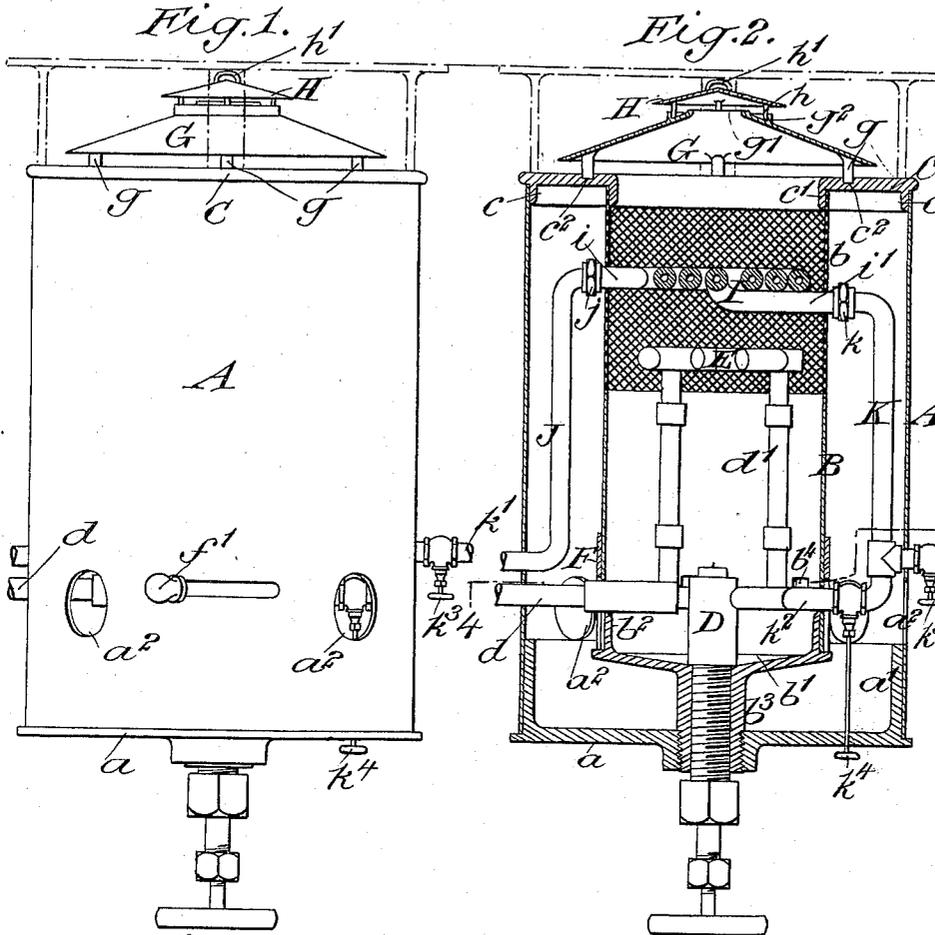
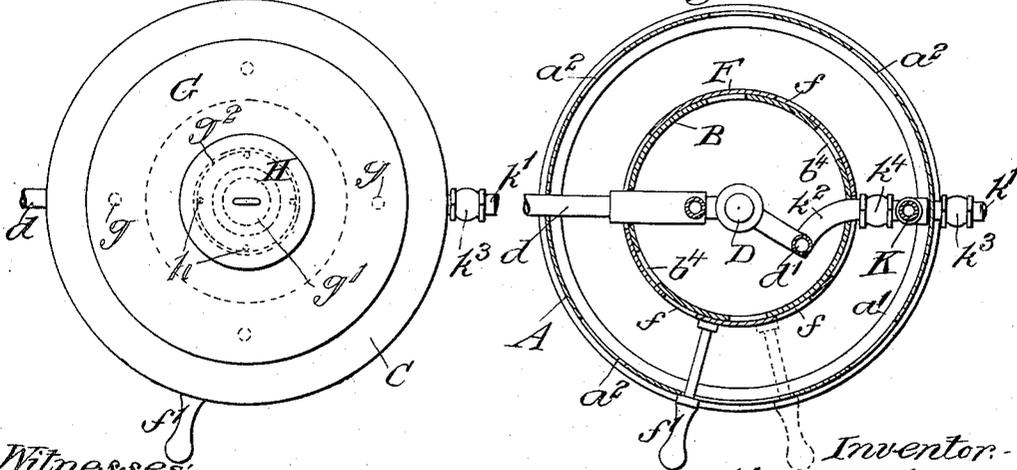


Fig. 3.

Fig. 4.



Witnesses:
George Barry Jr.
Edward Vreth.

Inventor:
Charles J. Search
by attorney
Thomson & Howard

UNITED STATES PATENT OFFICE.

CHARLES J. SEARCH, OF NEW YORK, N. Y.

VAPOR-STOVE.

SPECIFICATION forming part of Letters Patent No. 656,792, dated August 28, 1900.

Application filed February 27, 1900. Serial No. 6,670. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. SEARCH, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Vapor-Stoves, of which the following is a specification.

My invention relates to an improvement in vapor-burners in which the kerosene or the hydrocarbon oil from which the vapor is to be formed may be fed either under its own head or under pressure.

One object of my invention is to provide an improved structure comprising inner and outer hollow cylindrical casings, the inner casing being perforated from its top a considerable distance down toward its bottom, the main air-inlet openings in the inner casing being located at or near the plane of the burner proper and the air-inlet openings in the outer casing being located at or below the plane of the main inlet-openings in the inner casing.

A further object is to provide means for deflecting the heat as it passes upwardly through the top of the inner casing, so as to secure a uniform heat over an extended surface instead of a concentrated heat at one point.

A still further object is to provide an auxiliary vaporizer, located within the inner casing, whereby a portion of the heat may be utilized to vaporize an auxiliary supply of oil for use wherever required.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a side view of my improved burner. Fig. 2 represents a vertical central section through the same. Fig. 3 is a top plan view, and Fig. 4 is a transverse section on the plane of the line 4 4 of Fig. 2 looking toward the bottom of the burner.

The burner comprises an outer hollow cylindrical shell or casing A and an inner hollow cylindrical shell or casing B, concentric to the outer casing and spaced therefrom. The outer casing A is provided at its bottom with a suitable base a , provided with an upwardly-extended annular flange a' , which snugly engages the lower end of the body of the casing A and closes the same. The in-

ner hollow casing B is perforated from its open top for a considerable distance downwardly toward its bottom, which perforated portion is denoted by b . The bottom of the hollow casing B is closed by a cup-shaped base b' , having its uprising annular flange b^2 snugly engaged with the bottom of the body portion of the said inner casing. The space between the top of the outer casing and the top of the inner casing is closed by an annular ring C, which ring serves also to rigidly space the top of the inner casing from the outer casing. This annular ring C is preferably provided with an outer depending annular flange c , which snugly engages the top of the body portion of the outer casing A, and an inner depending annular flange c' , which snugly engages the top of the body portion of the inner hollow casing B. The bottom of the inner hollow casing B is held in position spaced from the sides and above the bottom of the outer casing by providing the cup-shaped base b' with a downwardly-extended central tube b^3 , which has a screw-threaded engagement with the base a of the outer casing.

The burner proper is denoted by D, and it is mounted within the inner casing B near its bottom, which burner may be of any well-known or approved form. A vaporizer-frame E is located within the inner hollow casing a short distance above the burner D, which vaporizer-frame preferably is located near the lower end of the perforated portion b of the casing. An oil-supply tube or pipe d leads from a source of oil-supply (not shown) through the outer and inner casing to the vaporizer-frame E. A pipe or tube d' leads from the vaporizer-frame to the burner proper.

The inner casing is provided with a plurality of main air-inlet openings b^4 , located at or near the plane of the burner proper, and the outer casing A is provided at or below the plane of the openings b^4 with a plurality of air-inlet openings a^2 . The amount of air to be admitted through the openings b^4 is accurately controlled by means of a cylindrical damper F, having an annular series of openings f therein, which damper is provided with a handle f' , which projects through the outer casing A in position to be easily grasped by the operator.

To deflect the heat as it escapes from the top of the inner casing, I provide a pair of removable cone-shaped deflectors, the lower one being denoted by G and the upper one by H. This lower deflector G is provided with a plurality of legs g , which are fitted to enter suitable recesses c^2 in the annular ring C, the bottom of the deflector when in position being spaced a slight distance above the top of the annular ring, so as to leave an open communication to the air between the deflector and ring. The deflector G is provided with a central opening g' . The upper cone-shaped deflector H is spaced above the opening g' in the lower deflector by means of a plurality of legs h , which rest upon the top of the deflector G. These legs are held in position, preferably, by providing the top of the deflector G with an annular uprising flange g^2 . The top of the deflector H is provided with a suitable hook or eye h' , so that the upper deflector may be removed to permit the auxiliary heating fluid to be poured into the cup-shaped base b' of the inner casing B.

An auxiliary vaporizing device is located within the inner casing B a short distance above the vaporizer-frame E. This auxiliary vaporizing device comprises a horizontally-disposed pipe-coil I, having its ends i i' projected through the walls of the inner casing. An auxiliary oil-supply pipe J leads from a source of supply (not shown) from the exterior through the wall of the outer casing A and is secured to the end i of the coil by a suitable coupling j . A vapor-conveying pipe K is suitably connected by a coupling k with the other end i' of the coil and leads therefrom to any point where it is desired to use the vapor. In the present instance I have shown the pipe K as being provided with two branches, the one k' of which leads outwardly through the wall of the outer casing and the lower branch k^2 of which leads inwardly into communication with the burner proper, D. I have shown the branch pipe k' as provided with a valve k^3 and have shown the branch k^2 as being provided with another valve k^4 . By manipulating the valves k^3 k^4 the vapor may be led from the auxiliary vaporizer either outwardly to any desired point or inwardly to form a reinforce for the burner proper, D. The auxiliary coil I, being located intermediate of the main vaporizer E and the surface against which the flame plays above the casing, whether the surface be deflectors or any other surface to be heated, receives when the flame is extinguished radiated heat both from above and below, and this serves to maintain the said auxiliary coil at a vaporizing temperature for a considerable length of time after the main vaporizer-coil has reached a temperature below the vaporizing-point. The length of time at which the vaporizer-coil will remain at a predetermined temperature is still further extended by making the walls of the

pipe which forms the auxiliary vaporizing-coil I very thick as compared with the diameter of the bore.

I have represented in the accompanying drawings in broken lines a suitable stand which might be used on the top of the burner as a support for heating or cooking utensils; but this forms no part of the present invention.

In operation the burner is started by first removing the upper deflector H and pouring the auxiliary heating fluid therethrough into the interior of the inner casing B. This auxiliary heating fluid is then ignited, and its heat will be sufficient to start the vaporization of the main oil-supply and then ignite the vapor as it issues from the burner proper. The air which passes in from the exterior through the openings a^2 in the outer hollow casing is divided, some of it passing through the openings b^4 in the lower portion of the inner hollow casing and the balance of it passing upwardly between the two casings and thence through the perforated portion into contact with the flame at this point. The amount of air to be admitted through the openings b^4 may be accurately determined by the damper F. By this means I am enabled to adjust the amount of air to be admitted to the plane of the burner and at the upper portion of the casing, so as to obtain the greatest amount of heat possible with a given supply of oil. The heat within the casing B is so intense that it will also keep the coil I of the auxiliary vaporizer at a red heat, the deflector G serving to confine the flame more or less, causing it to roll around within the top of the casing B. This heat will rapidly and thoroughly vaporize the auxiliary supply of oil, which may be led from the original reservoir, which feeds the main vaporizer, or from a separate reservoir, if so desired. The deflectors at the top of the casings also serve to spread the flame which escapes from the top of the inner casing over a large area, so as to insure practically the same amount of heat at the periphery of the base of a heating or cooking utensil as at the center. The auxiliary vaporizer I will remain heated for a considerable time after the flame has been extinguished, and when the vapor from the auxiliary vaporizer is led to the burner the said auxiliary supply of vapor may be ignited and utilized for again starting the burner, thus obviating the necessity of pouring in an auxiliary heating fluid into the interior of the casing for starting the main burner unless the flame has been extinguished for a considerable length of time.

The amount of vapor which is permitted to escape from the burner proper may be accurately regulated in any well-known and approved manner.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts without departing from the

spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is--

5 1. A vapor-burner comprising the burner proper, an inner hollow casing surrounding the burner provided with air-inlet openings at or near the plane of the burner and an
10 outer hollow casing surrounding and spaced from the inner hollow casing, the upper portion of the space between the inner and outer casings being closed, the said outer casing having air-inlet openings at or below the plane
15 of the air-inlet openings of the inner casing, substantially as set forth.

2. In a vapor-burner a burner proper, an inner hollow casing surrounding the burner having air-inlet openings at or near the plane of the burner, the said inner casing having its
20 upper portion perforated, an outer hollow casing surrounding and spaced from the inner casing, the upper part of the space between the inner and outer casings being closed, the said outer casing having air-inlet openings at
25 or below the plane of the burner for feeding air through the openings in the inner casing adjacent to the burner and also through the perforated portion of the inner casing, substantially as set forth.

3. A vapor-burner comprising a hollow casing, a burner proper and a main vaporizer located within the hollow casing, a body located
30 above the main vaporizer against which the flame is intended to impinge, an auxiliary vaporizer located intermediate of the main vaporizer and flame-impinged body, and independent of the main vaporizer, means for supplying liquid to the said vaporizers, and means
35 for conveying the vapor from the auxiliary vaporizer to the point of combustion, substantially as set forth.

4. A vapor-burner comprising a hollow casing, a burner proper and a main vaporizer located within the hollow casing, a body located
40 above the main vaporizer against which the flame is intended to impinge, an auxiliary vaporizer located intermediate of the main vaporizer and flame-impinged body, and inde-

pendent of the main vaporizer, means for supplying liquid to the said vaporizers, and means
50 for conveying the vapor from the auxiliary vaporizer to the point of combustion, the said auxiliary vaporizer being composed of a coil of pipe having thickened walls for retaining heat, substantially as set forth. 55

5. In a vapor-burner, a hollow casing closed at its bottom to form an auxiliary heating-fluid retainer, the said casing having an open top, a deflector located above and spaced from the top of the hollow casing, the said deflector
60 having a central opening therein, and a second removable deflector located above and spaced from the opening in the first-named deflector whereby the last-named deflector may be removed for permitting the auxiliary
65 heating fluid to be poured through the opening in the first-named deflector into the interior of the hollow casing, substantially as set forth.

6. In a vapor-burner, a burner proper, an inner hollow casing surrounding the burner having air-inlet openings at or near the plane of the burner, and having its upper portion perforated, an outer hollow casing surrounding
70 and spaced from the inner casing and having air-inlet openings therein at or below the plane of the burner for feeding air through the openings in the inner casing adjacent to the burner and also through the perforated
75 portion of the inner casing, the upper part of the space between the inner and outer casings being closed and a damper for opening and closing the openings in the inner casing for regulating the amount of air to be fed through the said openings and through the perforated
80 portion of the inner casing, substantially as set forth. 85

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of February, 1900.

CHARLES J. SEARCH.

Witnesses:

FREDK. HAYNES,
EDWARD VIESER.