

No. 711,918.

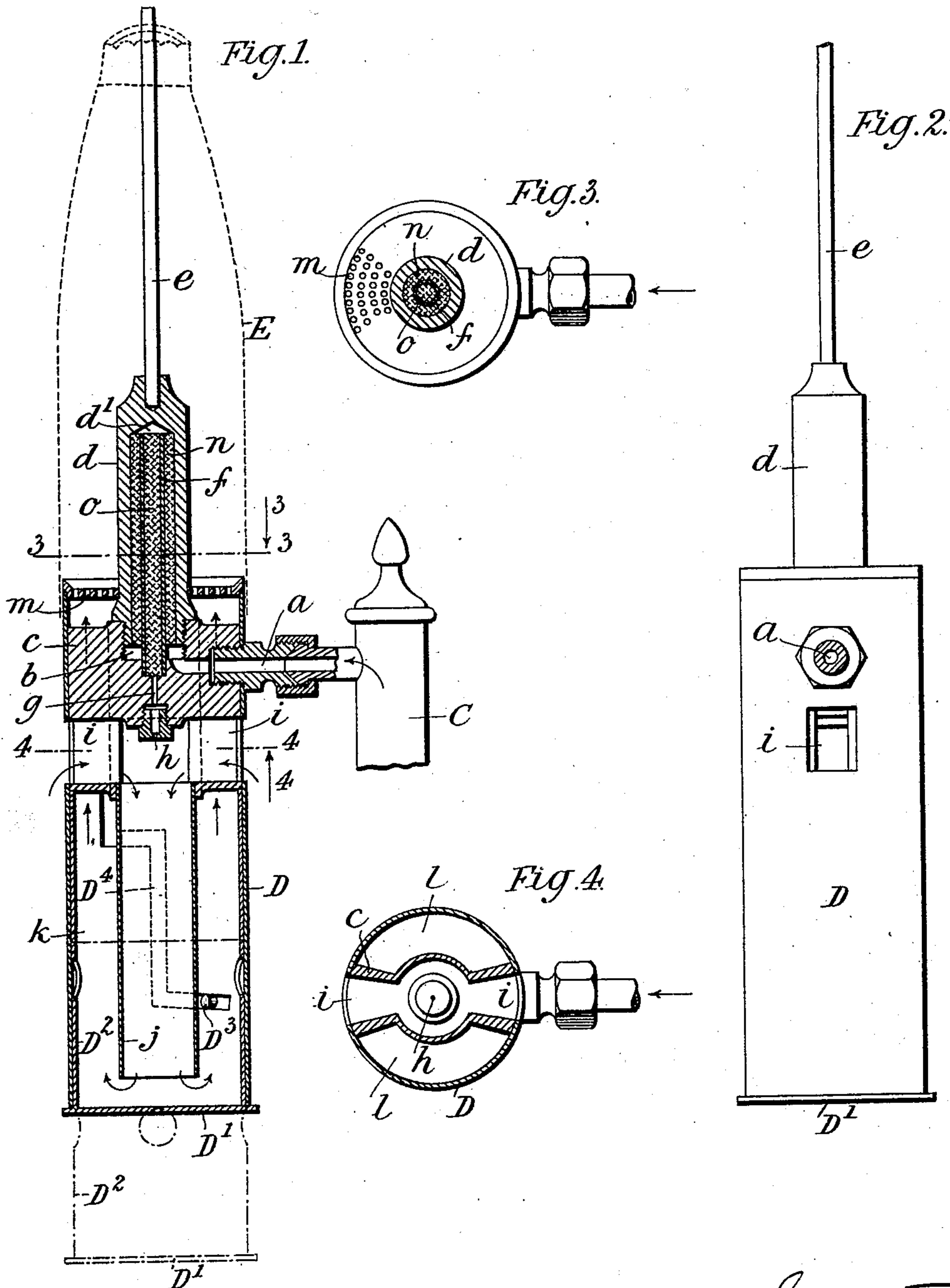
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A. BLANCHARD.

LIQUID HYDROCARBON VAPOR BURNER.

(Application filed Apr. 14, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ARTHUR BLANCHARD, OF LONDON, ENGLAND.

LIQUID-HYDROCARBON-VAPOR BURNER.

SPECIFICATION forming part of Letters Patent No. 711,918, dated October 21, 1902.

Application filed April 14, 1902. Serial No. 102,894. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR BLANCHARD, engineer, a subject of the King of Great Britain and Ireland, residing at 317 Great College street, Camden Town, London, England, have invented certain new and useful Improvements in Liquid-Hydrocarbon-Vapor Burners, of which the following is a specification.

10 This invention relates to hydrocarbon-vapor burners designed for consuming ordinary petroleum or similar hydrocarbon (particularly applicable for hydrocarbons of high-flash point) supplied under pressure and burning
15 with a non-luminous or Bunsen flame and in which carbon deposits are prevented from collecting in such wise as to interfere with the action of the burner, and has for its especial object to prevent said carbon deposits collecting in the jet-orifice of such burners, this burner being especially adapted and applicable for use in conjunction with incandescent
20 mantles (of the well-known Welsbach type or other suitable mantles) for lighting purposes, and in order that my present invention may be easily understood and readily carried into practice I will proceed to fully describe same with reference to the drawings hereunto annexed.

30 Referring to the accompanying drawings, Figure 1 is a vertical sectional view of the hydrocarbon-vapor forming and mixing chamber, with the aforesaid superheating-chamber situated in the middle of the flame—
35 *i. e.*, located inside the incandescent mantle adapted to be carried on said burner. Fig. 2 is a side elevation of same. Fig. 3 is a cross-sectional view of Fig. 1 on line 3 3 looking downward in the direction of the arrow 3.
40 Fig. 4 is a cross-sectional view on line 4 4, Fig. 1, looking upward in the direction of the arrow 4, Fig. 1.

C is a rising pipe leading from the oil-reservoir to the burner-casing D. E is an incandescent mantle supported on said burner,
45 and F is a globe supported by any suitable bracket or gallery carried on said rising pipe C. No chimney is required for use with this burner. The oil from the pipe C is led
50 through the pipe *a* to the chamber *b* in the block or support *c*, which is fixed inside the burner-casing D. In this block *c* is mounted

the detachable superheating-chamber *d*, (which I will hereinafter refer to as the "cap" *d*,) this latter being advantageously mounted 55 by being screwed into said block *c*, as shown in Fig. 1. The upper end of this cap *d* is is closed and may be utilized to carry therein the support *e* for the mantle E. The small tube *f* is located centrally inside said cap *d*, 60 the upper end of said tube *f* terminating a little distance below the inside of the cap *d* and the lower end of said tube *f* passing through the chamber *b* and being screwed or otherwise secured in the lower part of the 65 block *c* (see Fig. 1) and in communication with the duct *g*, (in said block,) leading to the jet-orifice *h*.

i i are air-inlets through the side of the burner-casing D and of any suitable size to 70 admit the required supply of air to mix with the hydrocarbon vapor issuing from said jet-orifice *h*. The hydrocarbon vapor issuing from said jet-orifice *h* draws in its required quantity of air as it issues from said jet-orifice 75 and the mingled air and hydrocarbon vapor pass down the tube *j*, which is centrally located within the chamber *d* and concentrically disposed with respect to the said jet-orifice, the said central tube *j* terminating a 80 little distance from the bottom D' of the casing D. The mingled air and vapor then pass upward (following the course indicated by the arrows in Fig. 1) through the annular 85 space *k* between said central tube *j* and the casing D, and thence passing upward through the vertical passages *l*, located on either side of the block *c*, thence emerge from the casing D advantageously through a gauze or perforated cap *m*, located in the upper end of said 90 casing D. Said mixture of air and vapor is now ignited and burns in a blue flame surrounding the cap *d* and rendering same intensely hot and at same time producing the most intensely-brilliant light through the me- 95 dium of any suitable mantle E.

In the annular space formed between the exterior of the tube *f* and the inside wall of the cap *d* I arrange any suitable porous or finely-divided heat-conducting material *n*— 100 such, for instance, as fine iron or steel wire gauze, which latter can be easily inserted or extracted and replaced when desired. The interior of the tube *f* is also filled with simi-

lar or any other suitable material *o*, adapted for the purpose, preferably such material *o* being also fine iron or steel wire gauze, which latter can be readily inserted or withdrawn
5 and replaced in the tube *f*.

To start the burner, same must be heated to a sufficient extent to vaporize the oil as same enters the burner, such preheating being effected in any suitable manner—for instance, by means of a hand-torch, such as a spirit torch, held under the burner until same starts, or, as illustrated in the drawings, I may construct the casing *D* with the bottom thereof *D'* formed as a sliding cup *D*², (see
15 Fig. 1,) which is adapted to be lowered into the position shown in dotted lines in Fig. 1, (and there maintained, for instance, by means of fixed studs *D*³, acting in zigzag slots *D*⁴, formed in the said sliding cup *D*²,) and in
20 this position a small quantity of methylated spirits placed in said cup *D*² can be ignited, and as soon as same has sufficiently heated the burner to start it thereupon said cup *D*² can be moved up and locked in the position
25 shown in full lines in Figs. 1 and 2.

The operation is as follows: The oil entering the burner through the conduit *a* is vaporized, and as said vapor rises through the porous material *n* in the annular space forming the superheating-chamber between the small tube *f* and the inside of the cap *d* said vapors are highly heated in a very even manner throughout and any tarry matter or particles of carbon formed during such vaporization is or are deposited. By the time the
35 vapor arrives at the top *d'* of said cap *d* said vapors have been heated to the maximum temperature desired, and not only this but the whole body of such vapor is now thoroughly
40 evenly heated throughout when it arrives at this point *d'*, and the decomposition of the hydrocarbon vapor is now complete for this temperature, and as this superheated vapor descends through the tube *f* and the porous
45 material *o* therein it receives no further increase of temperature, and consequently there is now no tendency to form deposits, so that

upon arrival of the said vapor at the jet-orifice *h* same will pass out of said jet-orifice without forming any, or practically without
50 forming any, carbon deposits thereon or in the vicinity thereof.

From time to time when desired the porous material *n* inside the cap *d* and the porous material *o* inside the small tube *f* can be removed and cleaned or replaced with new material; but in practice I have found that such cleaning or renewal is seldom necessary—for instance, only after two or three months' continuous use, and in some cases even more. 60

Having now described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a hydrocarbon-vapor burner, the combination of a retort, an incandescent mantle
65 mounted on said retort, a screen mounted near the base of the retort, a mixing-tube arranged to receive the vapor from the retort, a casing attached to the screen and surrounding the mixing-tube and provided with inlet-openings
70 to permit the air to pass to mix with the vapor jetted from the retort, and a movable cup closing the bottom of the casing and providing a means for holding the preheating fuel, substantially as described. 75

2. In a hydrocarbon-vapor burner, the combination of a retort, an incandescent mantle mounted on said retort, means for feeding oil to said retort, a screen mounted near the base of the retort, a mixing-tube arranged to receive the vapor from the retort, a casing attached to the screen and surrounding the mixing-tube, said casing being provided with air-inlet openings and said casing being made in two parts joined together by means of pins
80 and diagonal slots, the outer part of the casing being adapted to be moved and filled with preheating fuel, substantially as described. 85

In witness whereof I have hereunto set my hand in presence of two witnesses.

ARTHUR BLANCHARD.

Witnesses:

HENRY BIRKBECK,
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