(No Model.)

E. G. MUMMERY.

HYDROCARBON BURNER.

No. 563,398. Patented July 7, 1896.

Fig. 1.

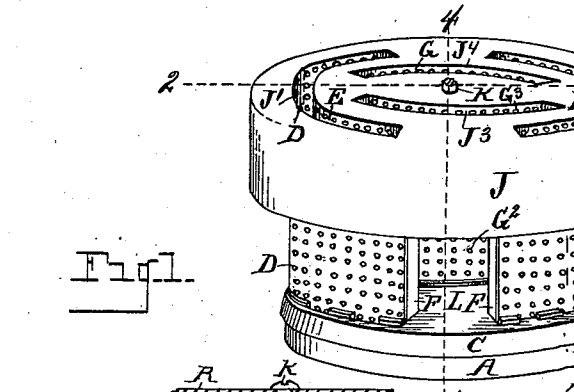
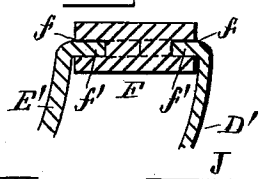
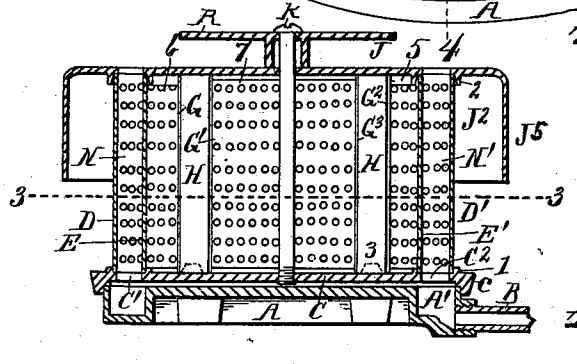
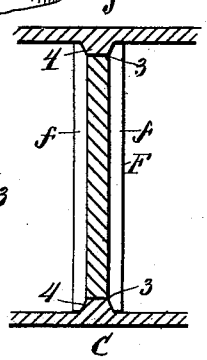


Fig. 5.







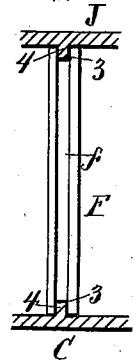


Fig. 2.

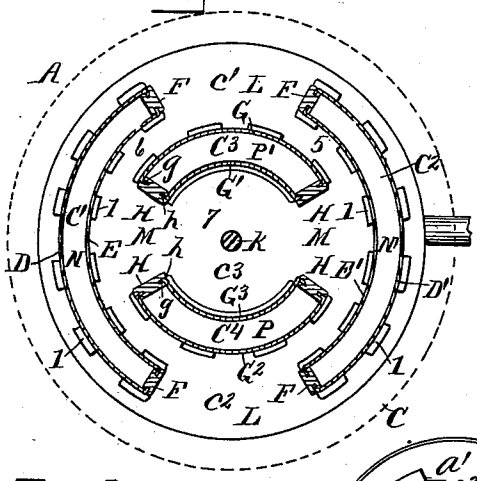


Fig. 6.

Fig. 7.

Fig. 4.

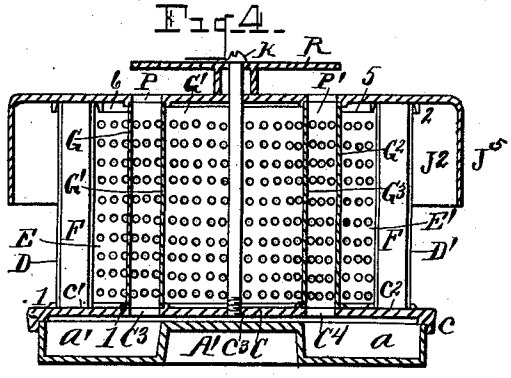


Fig. 3.

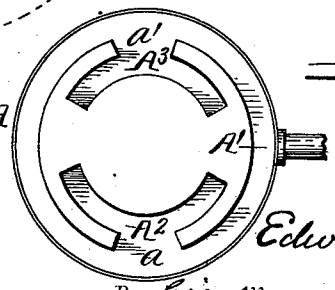


Fig. 9.

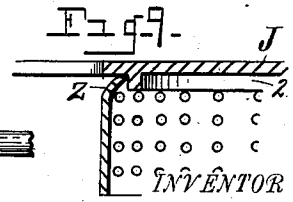


Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

EDWIN G. MUMMERY, OF DETROIT, MICHIGAN, ASSIGNOR OF ELEVEN-TWENTIETHS TO JOHN HUTTON AND GEORGE C. KEAYS, OF SAME PLACE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 563,398, dated July 7, 1896.

Application filed January 25, 1896. Serial No. 576,763. (No model.)

To all whom it may concern:

Be it known that I, EDWIN G. MUMMERY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Hydrocarbon-Burners; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My present invention has for its object certain novel improvements in the construction of a hydrocarbon-burner; and it consists of the structure, combination, and arrangement of parts hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in perspective, the spreader being removed. Fig. 2 is a vertical section on the line 2 2, Fig. 1. Fig. 3 is a horizontal section on the line 3 3, Fig. 2. Fig. 4 is a vertical section on the line 4 4, Fig. 1. Fig. 5 is a detail view showing the manner of engaging the perforated air-inlet plates with the vertical end castings. Fig. 6 is an additional detail showing the engagement of the base-plate and top plate with said end castings, said castings being in vertical section. Fig. 7 is a view in elevation and section at right angles to that shown in Fig. 6. Fig. 8 is a plan view of the channeled base. Fig. 9 is a detail view showing a modification in the construction of the foraminous walls.

My present invention is more particularly designed as an improvement upon a vapor-burner for which United States Letters Patent No. 530,705 were granted to me December 11, 1894, my present improvements having for their aim a burner of greater efficiency, simplicity, economy, and utility, and one which will not be liable to get out of order, and the parts for which may be readily assembled and held in place.

A represents a channeled base which is made imperforate, said base being provided with an outer channel A′ and with inner arc-shaped channels A^2 and A^3, each communicating with the outer channels as by connecting-channels a a' in said base, said connecting-channels being preferably located intermediate the ends of the arc-shaped channels A^2 A^3. B is a feed-pipe leading into the outer channel A′ of said base. Immediately above said base A is a base-plate C, preferably constructed with a peripheral flange c to set over the outer rim of the channeled base, as shown. This base-plate is constructed with channels or openings C′ and C^2, located above the corresponding portions of the outer channel A′ of the base A. The base-plate is also constructed with interior openings, (indicated in Fig. 4 at C^3 and C^4,) located above the interior channels A^2 A^3 of the base A and of corresponding form. The base-plate C is formed with lateral cover portions c' c^2 and a central cover portion c^3, the lateral cover portions c' c^2 covering the connecting-channels a a' in the base A, the center cover portion c^3 resting upon the interior raised portion of the base A between the channels A^2 A^3.

D and E represent foraminous or perforated walls located at the outer and inner edges of the opening C′, and D′ E′ represent similar foraminous walls located at the inner and outer edges of the opening C^2 in the base-plate C. These foraminous walls D E and D′ E′ extend respectively the length of the channels C′ C^2 in the base-plate C. At the extremities of the channels C′ C^2 are end castings or walls F, rising vertically to the same height as said foraminous walls with which said castings of the foraminous walls are engaged. The end castings are constructed with front and rear vertical grooves f, into which grooves are entered the adjacent ends of the foraminous plates about the channels C′ C^2, said foraminous walls each being flanged, as indicated at f', to enter the corresponding grooves f f.

G G′ and G^2 G^3 are perforated and foraminous walls located, respectively, about the inner and outer edges of the openings C^3 and C^4 in the base-plate C.

H denotes end castings or walls located at the extremities of the openings C^3 C^4, constructed of analogous form to the end castings F, said foraminous walls G G′ G^2 G^3 having flanged extremities, as indicated at g, entering corresponding grooves h in the end castings H.

J denotes a cover-plate formed with outer arc-shaped openings J′ and J^2 of a form corresponding to the channels C′ and C^2 in the base-plate C. Said cover-plate is also constructed with interior arc-shaped openings J^3 and J^4 of a form corresponding to the channels C^3 C^4 in the base-plate C. Said cover-plate is located upon the upper edges of the foraminous plates and end walls hereinbefore described. The base-plate C, I prefer to construct with an upwardly-projecting flange (indicated by the numeral 1) at the base of each of said foraminous plates, while the cover-plate J is constructed with a similar depending flange (indicated by the numeral 2) at the upper edges of each of said foraminous plates, said flanges on the base-plate C and on the cover-plate J holding said foraminous plates in engagement with said plates, respectively. To receive the base-plate C and cover-plate J, each of the end castings or walls F and H is preferably constructed with a recess (indicated at the numeral 3) at the upper and lower ends of said castings to receive corresponding lugs (indicated by the numeral 4) upon the base-plate C and cover-plate J. The end castings will be held in place thereby. A single bolt K is passed through the cover-plate into the base-plate C to hold said plates together with the foraminous walls and end castings in place.

The end castings or walls F at the extremities of the respective openings C′ C^2 are spaced apart, as indicated in the drawings, forming air-inlet openings therebetween, as indicated at L. The end castings or walls H of the respective openings C^3 C^4 are also spaced apart at the extremities of said openings, providing thereby air-inlet openings M therebetween.

The hydrocarbon fuel, it will be perceived, is admitted through the supply-pipe B into the outer channel A′ of the base, thence into the interior arc-shaped channels A^2 A^3. The foraminous walls D E and D′ E′, it will be perceived, inclose corresponding combustion-chambers N N′ above the openings C′ C^2, said chambers communicating through the corresponding openings J′ J^2 of the cover-plate J. So, also, the interior foraminous walls G G′ G^2 G^3 form therebetween interior combustion-chambers P P′ above the openings C^3 C^4 in the base-plate C, said latter combustion-chambers communicating through the corresponding openings J^3 J^4 in the cover-plate J. It will also be apparent that between the foraminous walls E E′ and the adjacent portions of the foraminous walls G G^2 are formed air-chambers, (indicated at 5 and 6), into which air is admitted through the openings L above described. Between the inner foraminous walls G′ G^3 an additional air-chamber 7 is also formed communicating with the air-chambers 5 and 6 through the openings M M, whereby a plentiful supply of air is furnished to the combustion-chambers through the corresponding foraminous walls, air also entering the exterior combustion-chambers through the outer walls D D′.

The cover-plate J is constructed with a depending annular flange J^5, spaced from the outer foraminous walls D D′, forming an outer air-chamber J^2, open at the base thereof. It will be perceived that the base A being imperforate, the heat all ascends therefrom, air being received to support combustion from the sides of the burner into the respective combustion-chambers. The heat thus all ascends immediately below the utensil that may be placed upon the burner.

It will be apparent that the perforated walls being held by the flanges on the base-plate and cover-plate, and by said end castings in the manner specified, all liability of warping of said perforated plates is reduced to a minimum.

The flanges 2 on the cover-plate are preferably made somewhat flaring, as indicated in Figs. 2 and 4, for convenience of assembling the parts, as thereby the cover-plate may be more readily located in position, the plate being drawn down firmly upon the upper edges of the foraminous walls and end castings by the connecting-bolt K.

It is desirable that the air should be admitted to the combustion-chambers as near the channels in the base as may be practicable. To this end, I prefer that the flanges on the base-plate C, which support the foraminous walls, should be cut away at intervals, as indicated more particularly in Figs. 1 and 3, thereby permitting the air to pass through the foraminous walls at the cut-away portions on a plane with the upper surface of the plate C.

To still more stiffen the foraminous walls and prevent their warping, my invention contemplates flanging the upper edges of said walls, if desired, as indicated at Z, Fig. 9.

While I have shown and described the use of the end walls or castings F and H to unite the ends of the foraminous walls about the respective combustion and air chambers, I would have it understood that I do not limit myself thereto, inasmuch as they might be dispensed with in the scope of my invention by prolonging and bringing together the flanged ends of said foraminous walls, as the flanges *f′* and *g*, as indicated in dotted lines, Fig. 5. Since the foraminous walls are held in place by the flanges on the base-plate C and cover-plate J, they could not work out of place if said end walls F and H were entirely omitted.

R denotes a spreader located upon the cover-plate J.

What I claim as my invention is—

1. In a hydrocarbon-burner, the combination of an imperforate base formed with an outer marginal channel, and with inner channels communicating with the outer channel, a base-plate provided with inner openings registering with the inner channels of the base, and with the outer openings above portions

of the outer channel of the base, respectively, foraminous walls located at the sides of said inner and outer openings of the base-plate, vertical end castings engaging the extremities of said foraminous walls, and a cover-plate resting upon the upper edges of said foraminous walls and end castings, the openings in said base-plate having spaces between their ends, substantially as set forth.

2. In a hydrocarbon-burner, the combination of an imperforate base formed with an outer marginal channel and with interior channels communicating intermediate their extremities with said outer channel, a base-plate constructed with outer arc-shaped openings C′, C² extending over a portion, only, of the outer channel of the base, and with inner arc-shaped openings C³, C⁴, registering, respectively, with the interior channels of the base, foraminous walls located at the sides of said openings of the base-plate, end castings engaging the extremities of said foraminous walls, and a cover-plate resting upon the upper edges of said walls and end castings, said openings in the base-plate having spaces between their ends, substantially as set forth.

3. In a hydrocarbon-burner, the combination of a base provided with an outer marginal channel, and inner channels communicating with the outer channel, a base-plate thereabove formed with outer openings C′, C² extending over a portion only of the outer channel of the base, and with inner openings C³, C⁴, registering, respectively, with the inner channels of the base, foraminous walls located about said openings of the base-plate forming combustion-chambers above said openings, vertical end walls engaging said foraminous walls, and a cover-plate, said openings in the base-plate having spaces between their ends, the foraminous and end walls forming interior air-chambers opening to the atmosphere at the sides of the burner, substantially as set forth.

4. In a hydrocarbon-burner, the combination of an imperforate base provided with an outside marginal channel and inside channels communicating intermediate their ends with the outside channel, a plate located above said base constructed with elongated orifices above said inside channels, and above portions of the outside channel of the base, foraminous walls located at each side of the orifices of said plate forming combustion-chambers N, N′, P, P′, and air-chambers 5, 6, 7, and a cover-plate provided with orifices above said combustion-chambers, the combustion-chambers N, N′ being separated at the extremity thereof to form air-inlet openings L L, and said combustion-chambers P, P′ separated at their extremities to form air-inlet openings M M, substantially as set forth.

5. In a hydrocarbon-burner, the combination of a base provided with an outer marginal channel A′, and with inner channels A², A³ communicating with the outer channel, a base-plate provided with outer elongated openings C′, C², extending over a portion only of the outer channel of the base, and with inner elongated openings C³, C⁴, registering with the inner channels of the base, respectively, foraminous walls located about said openings in the base-plate, forming interior air-chambers and combustion-chambers above said openings, and a cover-plate resting on the upper edges of said foraminous walls formed with openings J′, J² and J³, J⁴ above said combustion-chambers, the openings in said base-plate having spaces between their ends, substantially as set forth.

6. In a hydrocarbon-burner, the combination of an imperforate base provided with an outside marginal channel and inside channels communicating intermediate their ends with the outside channel, a base-plate located above said base constructed with inner elongated orifices above said inside channels, and with outer elongated orifices extending over a portion only of the outside channel of the base, foraminous walls located at each side of the orifices of said base-plate forming inner combustion-chambers P, P′ and outer combustion-chambers N, N′ overlapping the ends of the chambers P, P′, and air-chambers 5, 6, 7, and a cover-plate provided with orifices above said combustion-chambers, the openings in said base-plate having spaces between their ends, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWIN G. MUMMERY.

Witnesses:
N. S. WRIGHT,
M. A. MARTIN.