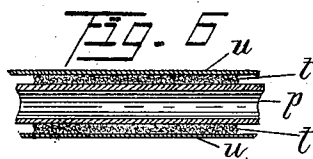
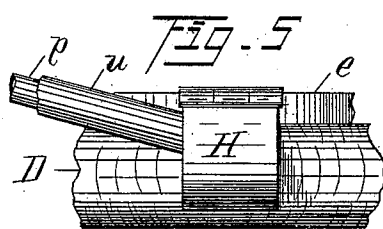
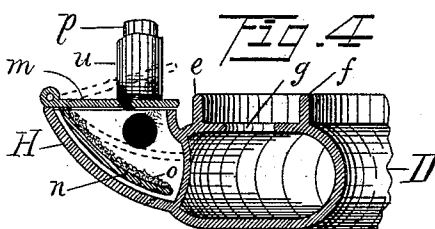
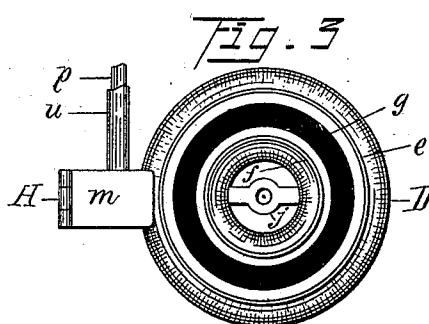
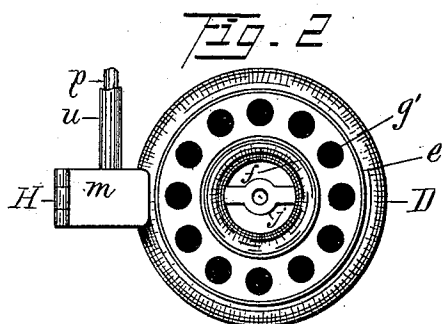
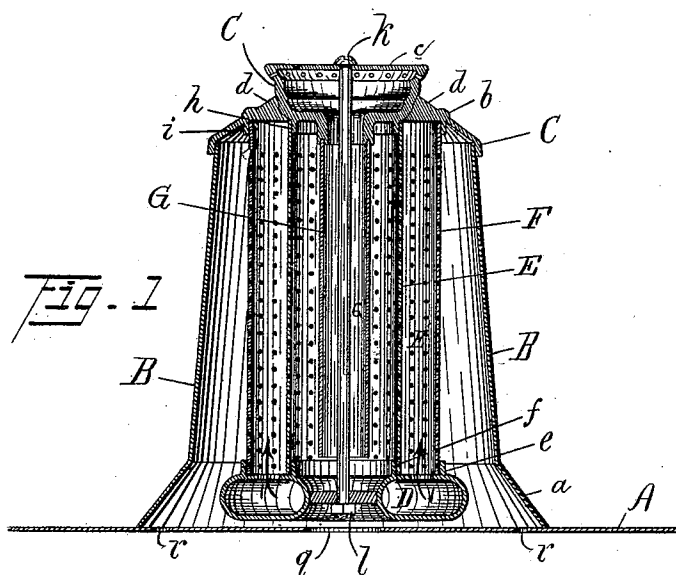


H. RUPPEL.
HYDROCARBON BURNER.

No. 464,717.

Patented Dec. 8, 1891.



Witnesses.
E. Gilbert
J. B. Butler

Inventor.
H. Ruppel
by W. A. Burnage atty.

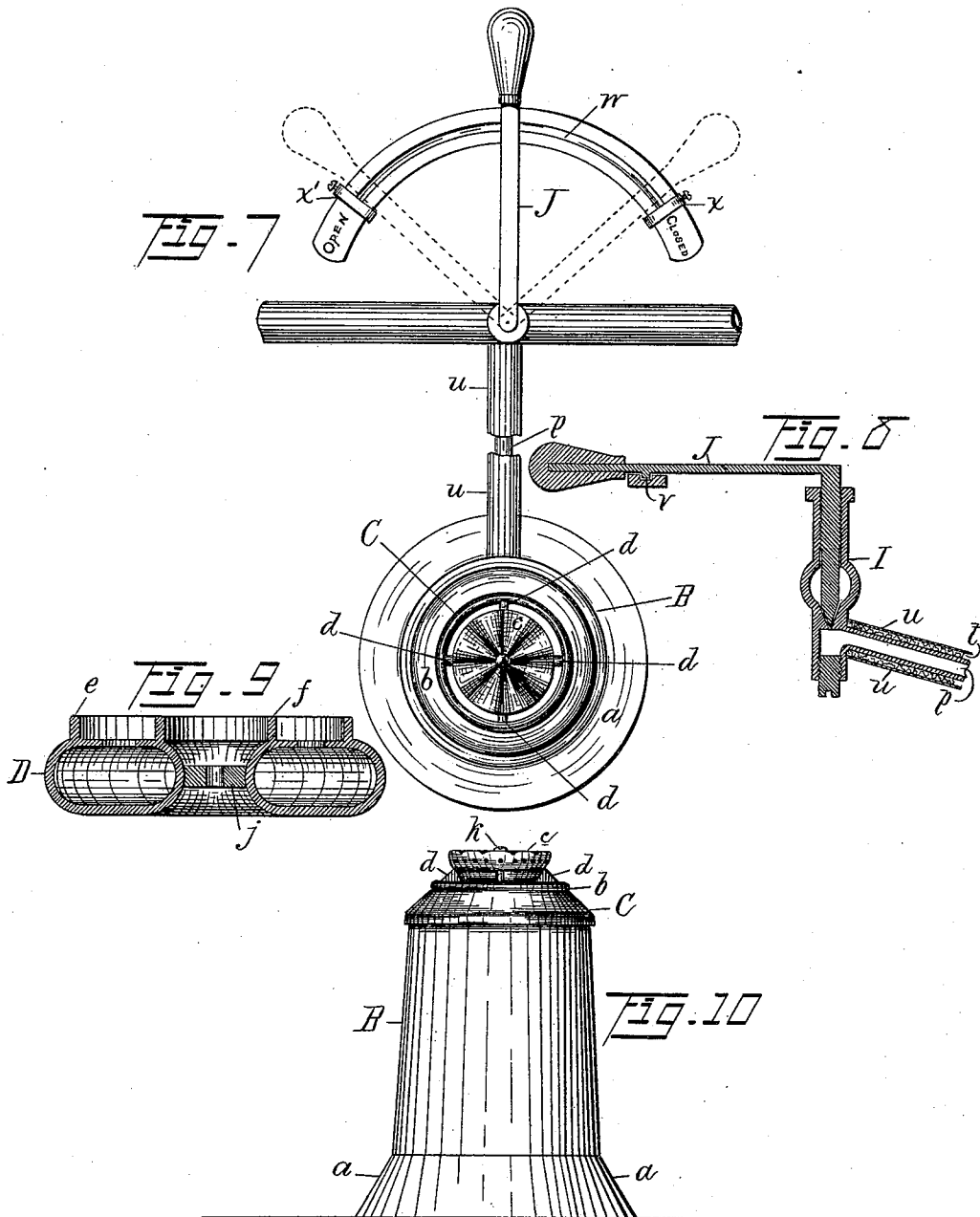
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Witnesses.

T. Gilbert
E. Butler

Inventor.

H. Ruppel
by *W. H. Burridge*
Att.

(No Model.)

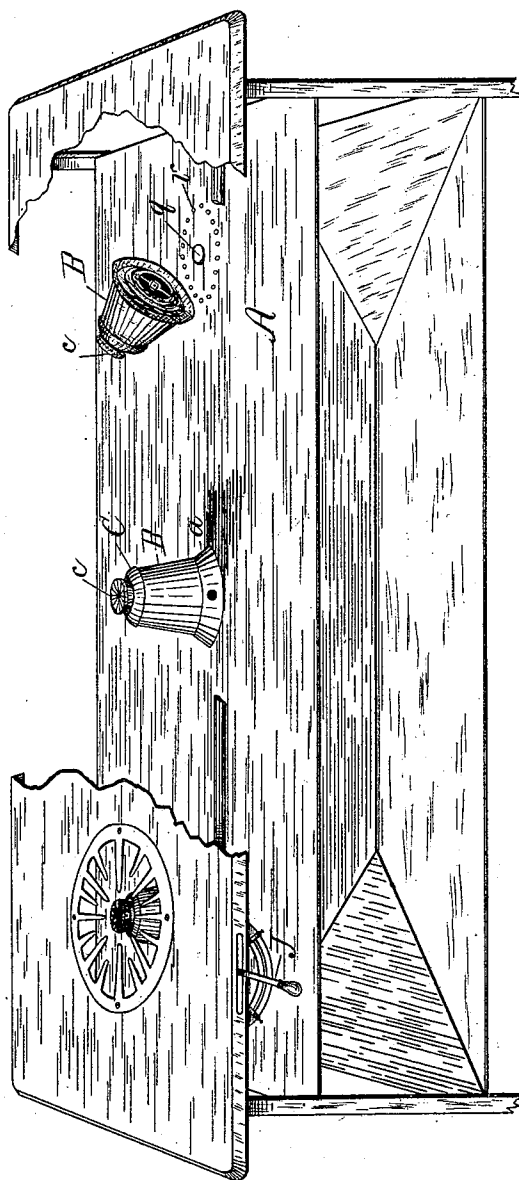
3 Sheets—Sheet 3.

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Fig. 11



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H. Gilbert
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Inventor.
H. Ruppel
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UNITED STATES PATENT OFFICE.

HENRY RUPPEL, OF CLEVELAND, OHIO, ASSIGNOR TO THE DANGLER STOVE AND MANUFACTURING COMPANY.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 464,717, dated December 8, 1891.

Application filed November 29, 1890. Serial No. 373,034. (No model.)

To all whom it may concern:

Be it known that I, HENRY RUPPEL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a full, clear, and complete description.

The invention relates to a hydrocarbon-burner erected upon a pan or shelf, said shelf being perforated, as hereinafter shown, and the burner being of the form and construction described, whereby the flame from hydrocarbon burning in an open annular chamber at the base of the burner rises direct from the exposed fluid through a flue formed by two perforated chimneys, producing a blue flame and consequently an intense heat, resultant from the admission of air on both sides of the combustion-chamber and through the center, as hereinafter fully set forth.

That the invention may be seen and fully understood, reference will be had to the following specification and annexed drawings, forming a part thereof, in which—

Figure 1 is a vertical section of my improved burner. Figs. 2 and 3 are detached sections hereinafter explained. Fig. 4 is an enlarged cross-section of part of an annular conduit forming a part of my improved burner, showing the attachment for lighting in cross-section. Fig. 5 is an enlarged side view of said lighting attachment. Fig. 6 is a sectional view of a portion of the supply-pipe. Fig. 7 is a plan view of my improved burner, showing the cut-off-valve mechanism in connection therewith. Fig. 8 is a longitudinal vertical section of said cut-off valve. Fig. 9 is a detached view hereinafter described. Fig. 10 is an elevation of the burner; and Fig. 11 is a perspective view of a portion of a stove, showing the position of the burners, one being tipped to show the perforation in the pan or shelf.

Like letters of reference designate like parts in the specification and drawings.

The important parts of my invention are best shown in vertical section in Fig. 1. The burner rests on a pan or shelf A, and consists of the outer casing B, which is substantially

of the form shown in drawings, flaring at the base, as indicated at *a*. The casing B is riveted, bolted, or otherwise attached around its upper edge to the cap C. The outer portion *b* of the cap C is connected with the central portion *c* by the arms *d d d d*, Figs. 1, 7, and 10, the entire cap, including the part *c*, part *b*, and the arms *d d d d* being preferably one piece. Within the casing B, near the base thereof, is arranged an annular conduit D. Said conduit is of the form shown in cross-section in Figs. 1 and 9. Figs. 2 and 3 are plan views thereof, showing two different styles which may be used. This conduit D is made of spun brass or its equivalent and is of one piece, as shown, having two flanges *e* and *f* raised thereon, the flange *e* being on the outside of the opening *g*, Fig. 3, (or the openings *g'*, Fig. 2, if that form is used) and the flange *f* on the inside thereof. To these two flanges *e* and *f* are attached two perforated chimney-walls E and F, which extend up and are attached at their upper edge to two corresponding flanges *h* and *i*, Fig. 1, on the cap C. The space between the tops of the two chimney-walls E and F is open, with the exception of that part taken up by the arms *d*, as shown in Fig. 7. A third wall G (not perforated) is attached to the cap C and extends down inside of and concentric to the wall E to a point near the line of the upper edge of the flange *f*, forming an air-induction tube in the center of the burner in open relation with the interior of the cap C. The space between the tops of the walls G and E is closed, as is also that between the wall F and the casing B. A cross-piece *j*, Figs. 1, 2, 3, and 9, is attached to the annular conduit D, and a bolt *k*, passing down through the center of the cap *c* and the air-flue *G'*, through the cross-piece *j*, having a nut *l* on the lower terminal thereof, secures rigidly together the various parts of the burner hereinbefore mentioned.

Extending outward from the annular conduit D, preferably from the front, is a projection H, Figs. 2, 3, 4, and 5, preferably an integral part of said conduit. The purpose of said extension or projection is to facilitate in lighting, as hereinafter fully set forth.

Said extension is constructed as shown in Fig. 4, having a cover *m*, hinged thereto.

Attached to the cover *m*, depending therefrom on the inner side, is a shelf *n*, substantially of the form shown, and covered with a layer of asbestos or its equivalent *o*.

Connected with the extension H is the induction-pipe *p*. When the cover *m* is raised, as shown by dotted lines, Fig. 4, the shelf *n* will become filled with hydrocarbon. It is then lighted and closed, when the hydrocarbon runs down into and around the annular conduit D, where it burns, thereby heating said annular conduit. The flame direct from the liquid hydrocarbon thus burning rises in the annular flue E', between the two chimney-walls E and F, in direction of arrow 1, Fig. 1. The air passing through the perforations in the pan and rising on both sides of said annular flue causes combustion in said flue, which develops a blue flame and intense heat.

The pan or shelf A is perforated under each burner, as shown in Figs. 1 and 11, having a large hole *q* in the center and a series of smaller holes *r* circumscribing it just inside the flaring portion *a*. The air passing up through these perforations, as above stated, causes combustion to take place in the annular flue E' between the chimney-walls E and F, resultant from said chimneys being perforated. Air also passes up through the air-induction tube or central flue G' into the chambered cap *c*, escaping therefrom through the holes *s* in said cap, thereby causing intense heat at the top of the burner.

The induction-pipe *p* is covered with asbestos or its equivalent *t*, held in place by a sheet-iron sleeve *u*, thus keeping the hydrocarbon cold in the pipe *p*. The flow of hydrocarbon through said induction-pipe is regulated by a valve I, of which Fig. 8 is a vertical section. The valve is operated by the arm J, having a lug *v* on the under side thereof, said lug working in a semicircular groove *w*, Fig. 7. The opening and closing of the valve is regulated by the stops *x x'*.

The flow of hydrocarbon can be so regulated by the use of the stops *x x'* as to obviate a great danger which has heretofore existed from leaving the valve open when the burner is not lighted, (particularly where gasoline is used,) thus allowing the liquid hydrocarbon to overflow. By the use of my improved burner and cut-off valve the stops *x x'* can be set to supply a sufficient amount of gasoline or hydrocarbon, and at the same time should the valve be opened to its full capacity and the burner not lighted the overflow will be so slight that it will vaporize as fast as it

overflows, thus avoiding a great danger and producing a saving of fuel. The tank can be placed even with, above, or below the top of the stove, as may be desired, the elevation of the tank in order to produce a sufficient pressure, as required ordinarily, not being necessary with my improved burner.

My improved burner is not alone valuable for cooking purposes, but also as a heater. The burner, being of the same form and construction, can be made larger than that necessary for cooking, when the outside casing B will form a large area of radiating-surface.

I am aware that the use of two perforated chimneys arranged concentrically one within the other is not new. I utilize the perforated chimneys in combination with the various other parts of my invention.

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

1. In a vapor-stove, the combination of the annular conduit D, the projection H, having the induction-pipe *p* connected therewith, and a lid pivoted thereto, said lid having a shelf depending therefrom covered with asbestos or its equivalent and arranged as described, whereby on the raising of the lid the hydrocarbon flows onto said shelf and when closed runs into and flows around the annular conduit, substantially as and for the purpose set forth.

2. In a vapor-stove, the combination of the perforated pan A, the outside casing B, the perforated chimney-walls E and F, non-perforated wall G, the annular conduit D, and the valve connection therewith arranged in the manner set forth, whereby high heat is generated from the liquid fuel within the flue E' and at the top of the burner, substantially as specified, and for the purpose described.

3. In a hydrocarbon-burner, the induction-pipe *p* in open relation with the annular conduit and lighting-cup H, said conduit formed from one piece with openings on the upper side, in combination with the perforated chimney-walls extending upward concentrically one within the other on each side of the openings in said conduit, operating conjointly with an inner non-perforated wall in open connection with the chamber of the perforated cap *c*, arranged substantially as and for the purpose specified.

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

HENRY RUPPEL.

Witnesses:

E. G. BUTLER,
A. E. GILBERT.