

No. 759,500.

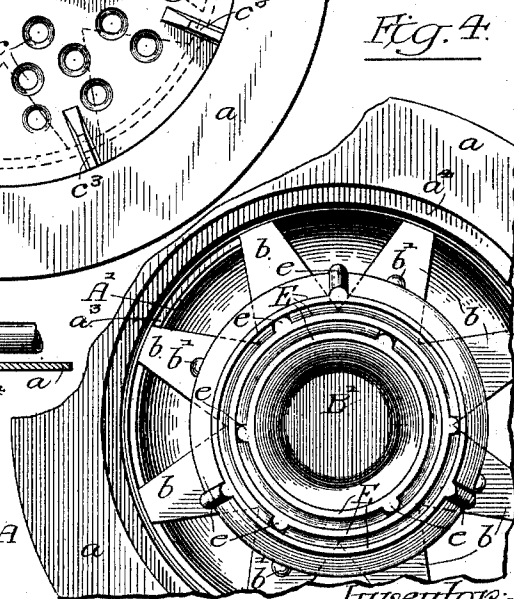
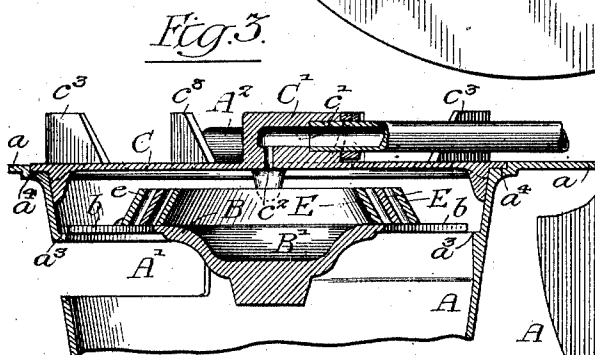
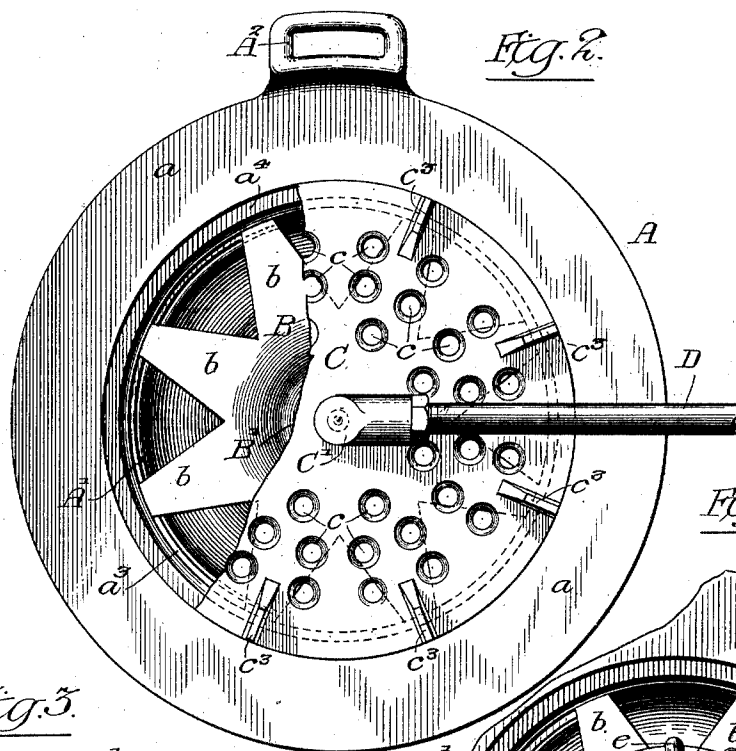
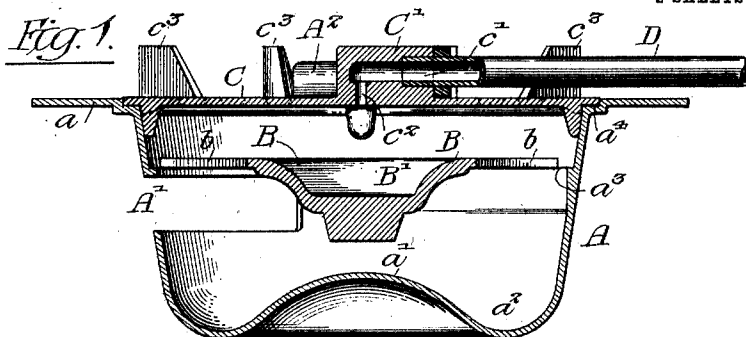
PATENTED MAY 10, 1904.

G. G. CALKINS.
OIL BURNER.

APPLICATION FILED SEPT. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

Wm. H. Whitehead

George R. McKinnis

Inventor:

Gary A. Calkins

By: Poole & Brown
Attys.

No. 759,500.

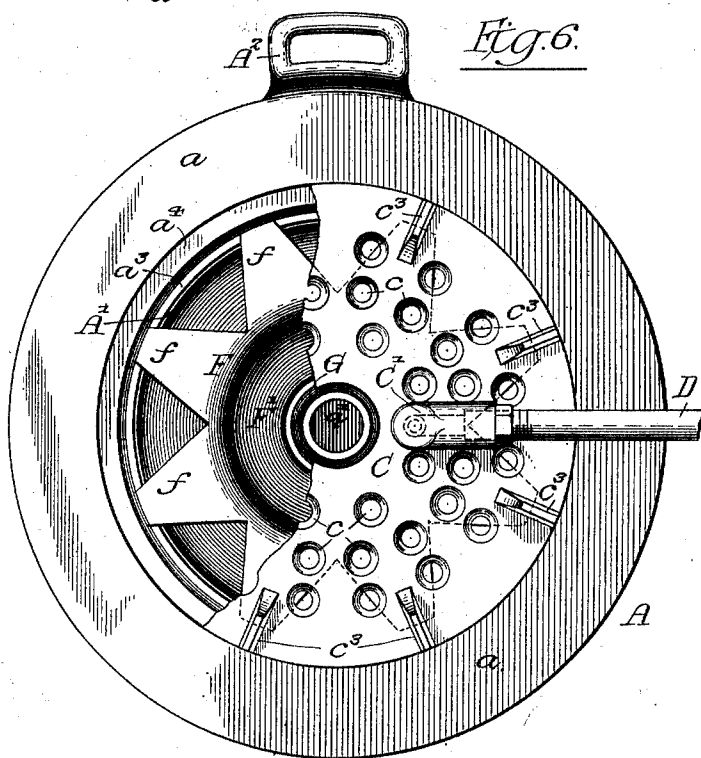
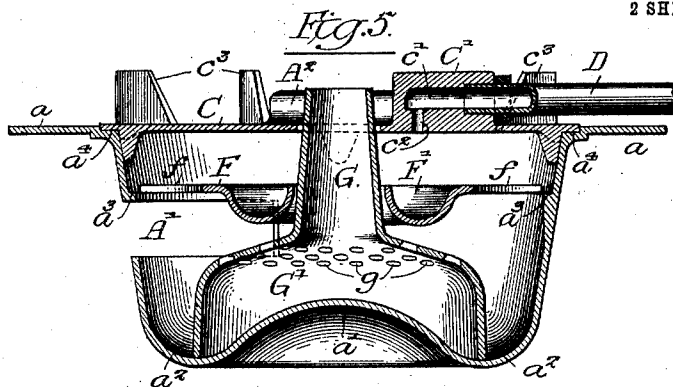
PATENTED MAY 10, 1904.

G. G. CALKINS.
OIL BURNER.

APPLICATION FILED SEPT. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:-

Wm. H. Whitehead

George R. Wilkins

Inventor:-

Gary G. Calkins

By:- *Pooler & Brown*

Attys:-

UNITED STATES PATENT OFFICE.

GARY G. CALKINS, OF EVANSTON, ILLINOIS, ASSIGNOR OF ONE-HALF TO
ALMON H. CALKINS, OF SANTA MONICA, CALIFORNIA.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 759,500, dated May 10, 1904.

Application filed September 21, 1903. Serial No. 173,949. (No model.)

To all whom it may concern:

Be it known that I, GARY G. CALKINS, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Oil-Burners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in oil-burning apparatus for domestic use, and more especially to oil-burners adapted for use in connection with cooking or heating stoves and which are adapted to be placed in one of the top openings of the stove in place of a removed lid. Some of the features of the invention are, however, adapted for use in connection with the burners which are located within a stove or otherwise applied or used.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view in central vertical section of a burner of circular form embodying my invention. Fig. 2 is a plan view thereof with portions of the top plate broken away to show the construction of the parts beneath. Fig. 3 is a section similar to Fig. 1, showing features additional to those illustrated in said Fig. 1. Fig. 4 is a plan view of the parts shown in Fig. 3 with the top plate of the burner removed. Fig. 5 is a view in cross-section of a burner embodying the features illustrated in Fig. 1, together with additional features by which a supply of air is furnished to the casing of the burner below the main burner-plate. Fig. 6 is a plan view of the construction shown in Fig. 5 with a portion of the top plate broken away to show the parts beneath.

As shown in said drawings, A indicates the outer or main casing or shell of the burner, which consists of a cup or basin shaped main part, having at its upper margin an outwardly-extending flat annular flange *a*, which is adapted to rest upon the top plate of a

cooking or other stove when the body of the casing is inserted in a hole or opening in the top plate of stove. An opening *A'*, large enough to permit the free egress of flame and products of combustion from the burner, is provided at one side of the shell or casing A, this opening preferably having the form of a horizontal slot and being located at a point between the top and bottom of the shell. This exit-opening *A'* may be directed toward any desired point by turning the circular burning casing or shell upon the stove so as to bring the opening in position to discharge toward the smoke-pipe of the stove or toward another opening in the top of the stove in case it is desired that the flames issuing from said exit-passage should be used to heat a vessel placed over such other opening. A loop or slotted arm *A²* is provided upon the margin of said flange *a*, which may be engaged by an ordinary stove-lifter for moving the shell of the burner or turning the same upon the stove. The bottom wall of the shell or casing A is provided with a central elevated part *a'*, which forms at the adjacent side walls of the shell an annular recess or receptacle *a²*.

Within the casing or shell A above the level of the exit-aperture *A'* is located a horizontally-arranged burner-plate B, which may be supported in any convenient manner within the shell, but, as herein shown, is adapted to rest upon an upwardly-facing ledge *a³*, which extends around the inner surface of the shell A just above the level of said opening *A'*. The burner-plate B is provided with a central depression or oil-receiving recess *B'*, while the outer or marginal part of said plate exterior to said recess is notched or serrated to form radial points or arms *b*, giving to the plate the general shape of a star. The outer ends of said arms *b* are adapted to rest upon the annular supporting-shoulder *a³*.

Over the top of the casing or shell A is placed a horizontal top plate or cover C, which is located at some distance above the burner-plate B and rests at its margins upon the upper edge of the main or body portion of the shell A. Said main or body portion of the shell is shown

as provided with a groove or rabbet a^4 , which receives the marginal part of the plate C, so that the surface of said plate is flush with the marginal flange a of said shell. The said top plate or cover C is provided with a large number of small air-inlet openings e , which are distributed equally around the center thereof and by which air to support combustion is admitted to the burner-casing above the burner-plate B. At the center of said plate B an upwardly-projecting boss C' is cast upon the plate, to one side of which is attached a supply-pipe D, by which oil or liquid fuel is supplied or fed to the burner. Said supply-pipe D communicates with a horizontal passage c' in the boss C' , and from the inner end of said passage c' a vertical feed-opening c^2 extends downwardly through the boss C' and the top plate C and opens at the center of said top plate over the central depression or recess C' of the burner-plate B. Around the outer margin of the top plate C are formed a series of raised projections or supporting-lugs C^3 , which rise to or above the level of the central boss C' and which serve to support the cooking utensil or vessel in position over the burner.

In the operation of the burner made as described and shown in Figs. 1 and 2 the burner is started by admitting a quantity of oil from the supply-pipe D to the central recess or receptacle B' of the burner-plate B, and this oil is lighted and allowed to burn until the said burner-plate B and adjacent parts become highly heated. After said parts have reached a sufficiently high temperature to insure the vaporization of the oil as soon as it comes in contact with the said burner-plate oil is then admitted from the supply-pipe, so that it will fall drop by drop upon the center of said burner-plate and will be fed thereto no faster than it is evaporated or converted into vapor. The oil-vapor is burned as rapidly as it is produced. A constant supply of air to support combustion is afforded by the numerous small air-inlet holes e in the plate C, which furnish an abundant supply of air above the marginal part of the burner-plate. The flames rising from the burning vapor pass from the central part of the burner-plate B outwardly over the marginal part of the said burner-plate and downwardly through the openings between the arms b of said burner-plate into the lower part of said shell or casing A, from which said flames and the products of combustion make their exit through the lateral slot or opening A' .

The construction shown in Figs. 3 and 4 is generally like that illustrated in Figs. 1 and 2 and hereinbefore described. In said Figs. 3 and 4 are shown a plurality of rings E E, which rest upon and rise from the burner-plate B, and are arranged to deflect the flames rising from the burning vapor upwardly toward the top plate C, as said flames and the products of combustion move outwardly to-

ward the outer margin of the burner-plate prior to their descent through the opening between the arms $b b$ of said plate. The rings E E are shown as made of conical form and as three in number, but they may be of other shape and greater or less in number. The outermost of these rings E are made of such diameter to rest upon or over the inner ends of the arms $b b$ of the burner-plate, so that flames and products of combustion passing downwardly between the said rings will pass through the spaces between said arms. In the particular construction shown the rings E E are provided on their outer surfaces with transverse ribs e , which serve as spacing-ribs to hold the rings concentric with each other and at a proper distance apart, and the several rings are held in place upon the burner-plate by means of lugs b' , which rise from the top surfaces of said arms in position to engage the lower edges of said rings.

Figs. 5 and 6 illustrate a construction which embraces the same main features illustrated in Figs. 1 and 2, together with means for supplying additional quantity of air to support combustion to the interior of the shell or casing of the burner. In this instance a burner-plate F is employed, which corresponds generally in location and function with the burner-plate B, but which has a central opening and an annular trough or oil-receptacle F' surrounding said central opening. Said burner-plate F is provided with radial arms f , like those before described. In connection with the said plate F, I employ a central shell or casing embracing a central upright air-tube G and a lower part or bell G' , which latter is located below the burner-plate F and rests at its lower edge upon the bottom of the shell A. The central air-tube G rises from the top of the bell G' through the central opening in the plate F and also through a central opening formed in the top plate C to a point above the top surface of said top plate. The boss C' , through which the oil is fed to the burner, is in this instance formed on the top plate C at one side of the central opening therein and above the annular trough-shaped receptacle F' , so that oil fed through the supply-pipe D and passing through the exit-passage c^2 and which falls upon or into the bottom of the trough F' is by the heat of the burner-plate vaporized, as before described. During the progress of combustion air is not only supplied to the top of the flame by holes in the top plate C, but an additional supply of air is drawn inwardly through the pipe D and enters the bell G' , from which it escapes through a plurality of air-openings g , formed in the top part or wall of said bell. The air thus supplied through the opening g comes in contact with the flames and burning gases which pass downwardly through or between the arms $f f$ of the burner-plate, thereby affording an abundant supply of oxygen to said flames and insuring

complete combustion before the products of combustion pass from the casing through the exit-slot A'.

The burner arranged and operating as described is adapted for use with any suitable liquid fluid, such as crude petroleum, unrefined petroleum distillate, or kerosene. Such burner is especially adapted for use of the cheaper fuels, such as crude petroleum or unrefined distillate, because it has no small or narrow pipes or passages in which the fuel is vaporized and which would become choked up or rendered inoperative by the accumulation of hard or tarry residuum from the burning fuel, it being obvious that as evaporation takes place from the surface of the heated burner-plate described any solid residuum left after the burner has been a long time in use may be readily removed or scraped from said plate.

While the burner-casing is herein shown as circular, this particular shape in the burner-casing is not essential, and the same may be made of other form. It is, moreover, to be understood that the particular details of construction illustrated in the accompanying drawings constitute only one practical or convenient form in which the invention may be embodied and that in carrying out the same it may be structurally varied in many ways without departure from my invention, the essential features of which are pointed out in the appended claims.

I claim as my invention—

1. An oil-burner comprising an external casing or shell provided with a lateral exit-opening and having a top plate or cover apertured for the downward passage of air therethrough, a burner-plate within the casing provided with marginal arms or projections forming an annularly-arranged series of openings adjacent to the wall of the casing, and means affording a supply of liquid fuel to the part of the burner-plate within said arms or projections.

2. An oil-burner comprising an external casing or shell, provided with a lateral exit-opening and having a top plate or cover provided with a plurality of apertures for the admission of air and a burner-plate supported within said casing, said burner-plate having marginal arms or projections forming openings through which the flames and products of combustion pass downwardly to the part of the shell or casing below said burner-plate, and a receptacle for liquid fuel within said arms or projections.

3. An oil-burner comprising an external casing or shell provided with a lateral exit-opening and with a top plate or cover apertured for the admission of air, and a burner-plate supported within said casing, said burner-plate having marginal arms or projections forming openings through which the flames

and products of combustion pass downwardly to the part of the shell or casing below said burner-plate, said top plate being provided with an upwardly-extending boss provided with a passage which opens downwardly through said top plate upon the part of the burner-plate within said arms or projections, and an oil-supply pipe connected with said boss.

4. An oil-burner comprising an external casing or shell, provided with a lateral exit-opening, and with a top plate or cover apertured for the admission of air, and a burner-plate supported within said casing, said burner-plate having marginal arms or projections forming openings through which the flames and products of combustion pass downwardly to the part of the shell or casing below said burner-plate, means supplying liquid fuel to the part of said plate within said arms or projections, and a plurality of rings resting upon said burner-plate around the central portion thereof.

5. An oil-burner comprising an external casing or shell provided with a lateral exit-opening, and with a top plate or cover apertured for the admission of air and a burner-plate supported within said casing, said burner-plate having marginal arms or projections forming openings through which the flames and products of combustion pass downwardly to the part of the shell or casing below said burner-plate, and a receptacle for liquid fuel within said openings, and a plurality of rings resting upon said burner-plate around the said receptacle, said rings being separated by spaces permitting the downward passage of flames and products of combustion between them.

6. An oil-burner comprising an external casing or shell, provided with a lateral opening, and with a top plate or cover apertured for the admission of air and a burner-plate supported within said casing, said burner-plate having a centrally-arranged receptacle for the liquid fuel, and marginal arms or projections forming openings through which the flames and products of combustion pass downwardly to the part of the shell or casing below said burner-plate, a central air-supply tube extending downwardly through the top plate and the center of said burner-plate, and a chamber or bell connected with the lower end of said tube and having apertures for the passage of air to the interior of the casing.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 11th day of September, A. D. 1903.

GARY G. CALKINS.

Witnesses:

C. CLARENCE POOLE,
GERTRUDE BRYCE.