(No Model.)

A. H. CALKINS.

LIQUID FUEL BURNER.

No. 419,825. Patented Jan. 21, 1890.

Fig 1.

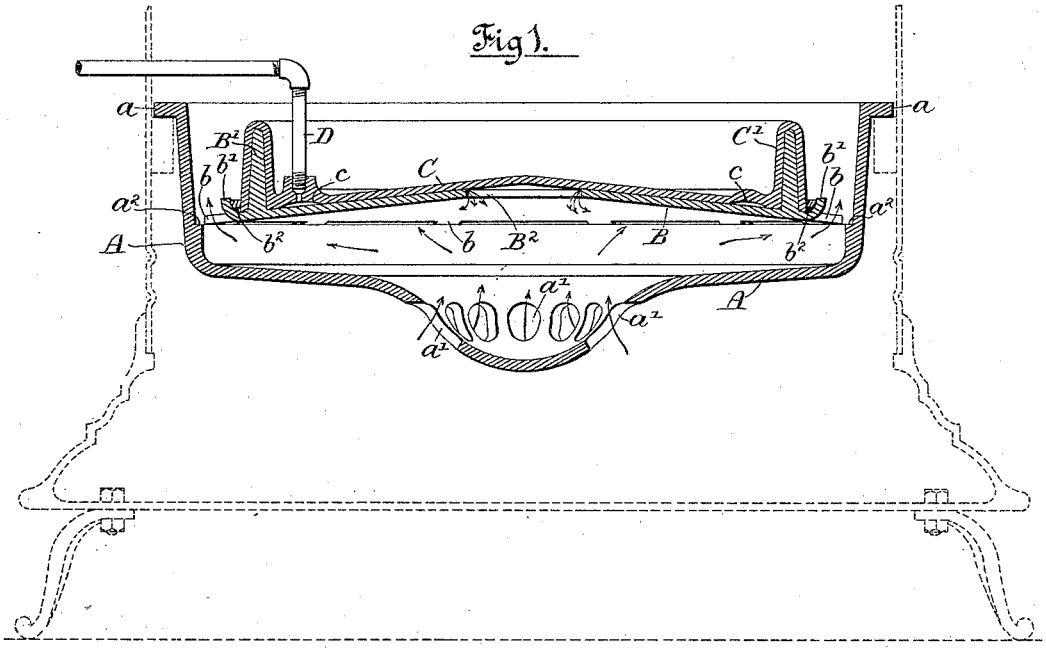
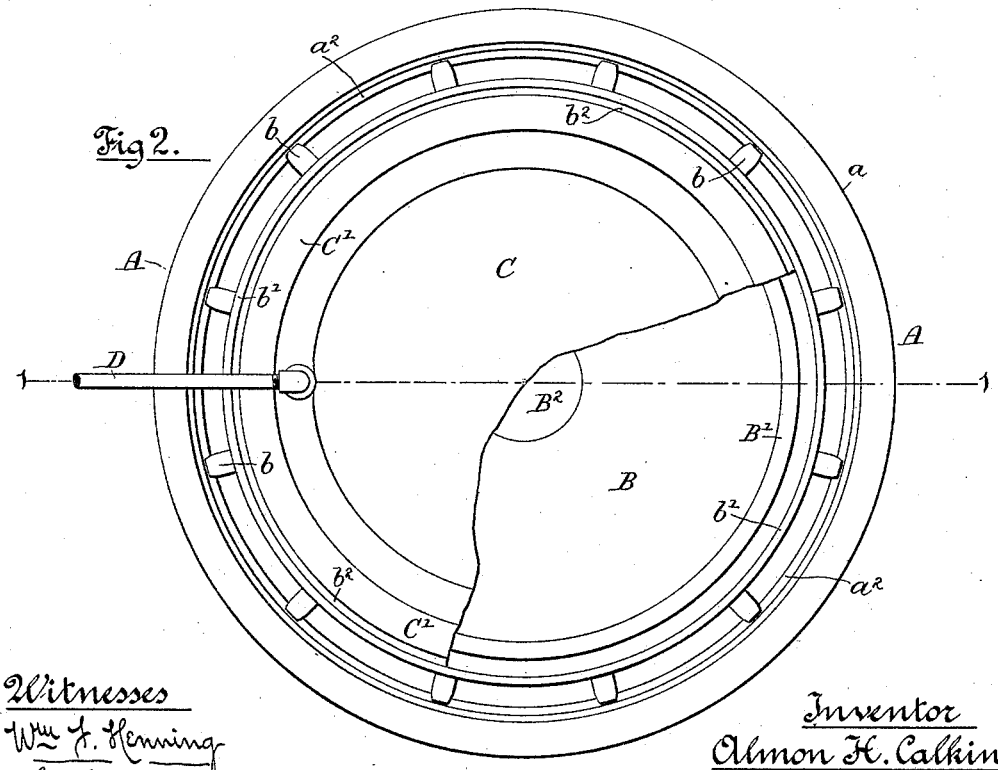


Fig 2.



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UNITED STATES PATENT OFFICE.

ALMON H. CALKINS, OF CHICAGO, ILLINOIS.

LIQUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 419,825, dated January 21, 1890.

Application filed December 7, 1888. Serial No. 292,937. (No model.)

To all whom it may concern:

Be it known that I, ALMON H. CALKINS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Fuel 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-burners of that class shown in a prior application, Serial No. 266,921, filed by me in the United States Patent Office March 12, 1888, and comprising two parallel plates, the adjacent surfaces of which are placed close together, said plates having an extended area of heating-surfaces, between which the fuel is confined in passing from the supply-pipe to the margins of the plates, where the vapor or gas formed by the heating of the liquid fuel is burned. The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating the invention, Figure 1 is a central vertical section of an oil-burner embodying the same, taken upon line 1 1 of Fig. 2. Fig. 2 is a plan view of the burner shown in Fig. 1, with a part of the top plate broken away to show parts beneath.

As shown in the said drawings, A is a concave or basin-shaped casting forming the exterior shell or casing of the burner. Said shell has a nearly-flat bottom and approximately cylindric side walls, and is provided at its upper margin with an outwardly-extending flange *a*, which may engage suitable lugs or a ledge on a circular stove of the kind shown in dotted lines in Fig. 1, for supporting the burner. Said casing may, however, be otherwise supported within a stove or heating apparatus. Said shell is provided at its bottom near its center with a series of air-inlet openings a' a'.

Within the casting A is placed a circular plate B, which is arranged centrally within the said casting above the bottom thereof. Said plate B is somewhat smaller in diameter than the interior of the said casting A, and is preferably made in the shape of a flattened cone arranged with its apex upwardly. The plate may be supported in any suitable manner within the casting A, but is herein shown as provided with radial arms or lugs b b at its margins, which extend outwardly and rest upon an annular ledge a^2, formed on the inner surface of the side wall of the casting A. Said plate B is provided near its outer margin with an annular rib or flange B′, extending upwardly therefrom in the manner illustrated.

C is a second circular plate having the same general shape as the plate B and placed over the latter. Said plate C is provided about its margins with a deep flange C′, extending upwardly from the plate and provided with an annular recess extending inwardly therefrom from the under side of the plate C, thereby making the said flange C′ hollow, or, in other words, giving it a U-shaped form in cross-section. Said U-shaped flange C′ is fitted to and rests in contact with the flange B′ of the plate B. Between said plates B and C, inside of the flange B′ and extending around the plates, is formed a passage *c*, with which is connected an oil-supply pipe D. The lower plate B is provided with a central opening B^2, at which the vapor or gas formed from the oil fed between the plates through the oil-pipe D and passage *c* is burned. As far as the general features of the invention are concerned this hole may be varied in size and location as may be found desirable or necessary in practice. In the drawings the hole is shown as made of considerable size, and said plate B is shown in contact with the under surface of the plate C up to a point near the margins of the hole, so that the vapor or gas is burned as it issues from between the said plates.

As a separate and further improvement I make a tight joint between the margins of the plates B and C by providing a groove b' around the margin of said plate B, in which groove the depending edge of the plate C is inserted, a quantity of fusible metal—such as lead—being poured into said groove b' in a molten state and allowed to harden. The engagement of the flange C′ with the flange B′ holds the plates firmly in proper relative po-

sition, while the metal filling or packing thus inserted, as indicated at b^3, prevents the escape of fuel in either a liquid, vaporous, or gaseous state from between the margins of the plates. The plates B and C are placed so close together as to form an exceedingly narrow space between them, and for this purpose are not usually supported free from contact with each other, but are made of metal of ordinary smoothness, and are allowed to rest one upon the other. The flange B′ is, however, fitted tightly to the U-shaped flange C′, in order to lessen liability of the escape of vapor or gas at the margins of the plates B and C. Any slight escape of vapor or gas at this point is, however, of no great consequence, inasmuch as any vapor or gas escaping will be immediately burned at the outer margins of said plates.

In the operation of the burner thus constructed the oil fed through the pipe D into the chambers C′ passes outwardly between the plates C and B in the form of a very thin film, and, inasmuch as said plates are heated by the flame of the burner, is converted by the heat into vapor, and is further converted by the heat of such plates into a permanent vapor or gas, which is burned at the orifice B′. The flames, from combustion taking place at the orifice B′, pass outwardly beneath the bottom plate B to the outer margin of said plate and escape between said margins of the plate and the sides of the shell A. It will of course be seen that the flames impinge against the said bottom plate B as they pass outwardly over the same, and thereby retain the said plate C in contact therewith at a high temperature. The bottom plate B will, however, be subjected to the greatest heat, and does in fact often become red-hot, so that the vapor or gas, passing between said plates B and C toward the exit-opening, is very highly heated before it is burned.

I claim as my invention—

1. A burner for converting liquid fuel into vapor or gas and burning the same, comprising two parallel circular plates placed together with their edges in contact with each other, and having a fuel-passage formed between them near their outer margins and a fuel-supply pipe leading to the said fuel-passage, one of said plates being provided with a central orifice, at which the vapor or gas is burned, substantially as described.

2. A burner comprising a circular plate B, provided with a marginal flange B′, a circular plate C, having a U-shaped marginal flange fitted over the flange B′, an oil-pipe communicating with the space between the plates C and B, one of said plates being provided with a central orifice, at which the vapor or gas is burned, said plate B being provided with an annular marginal groove, in which the margin of the plate C is inserted, and a fusible-metal filling in said groove, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

ALMON H. CALKINS.

Witnesses:
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