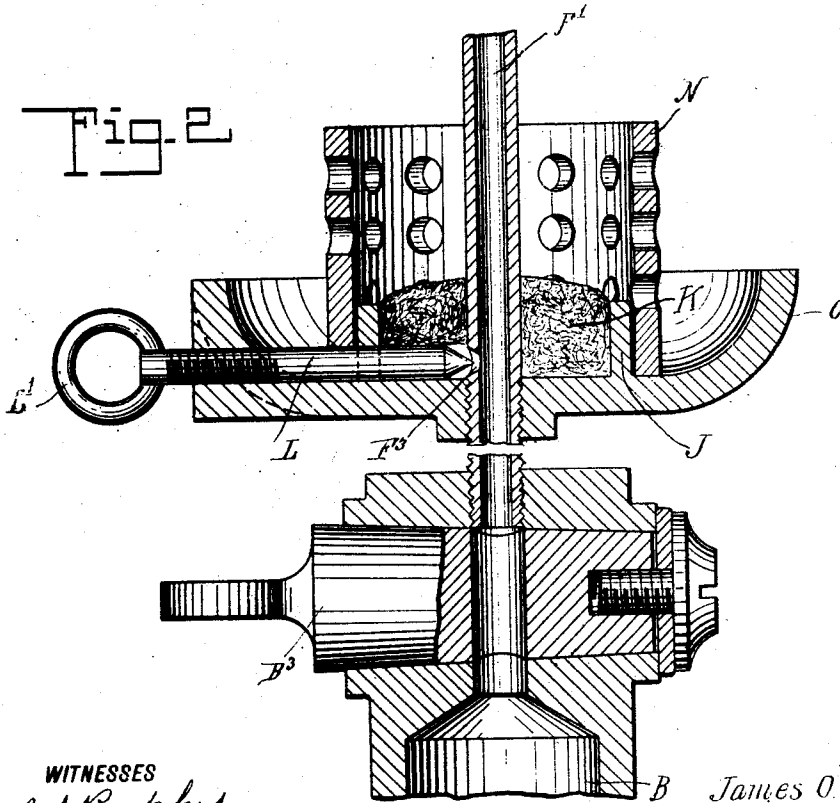
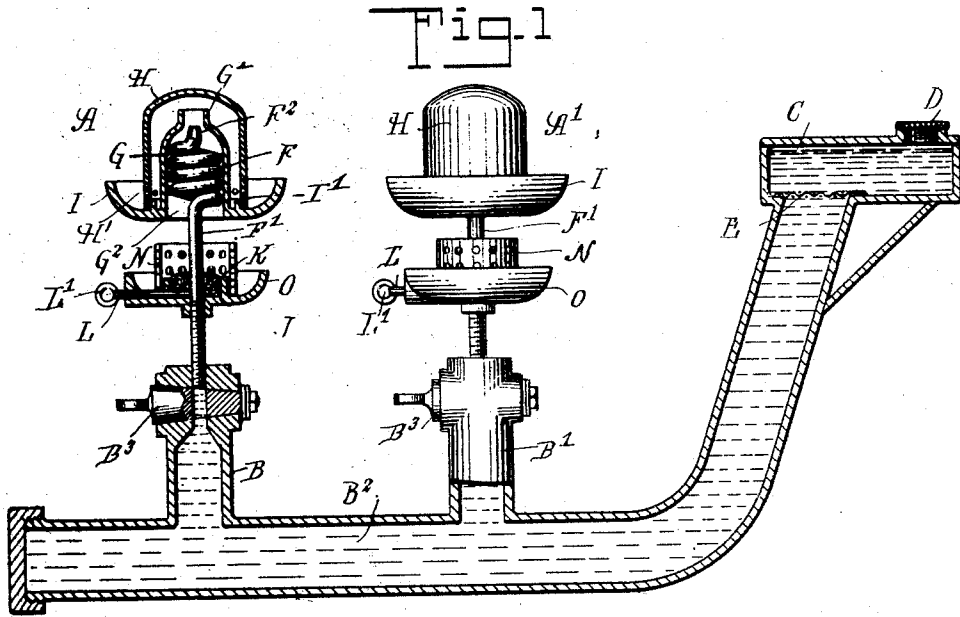


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 BURNER.  
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1,032,811.

Patented July 16, 1912.



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# UNITED STATES PATENT OFFICE.

JAMES O. BROOKBANK, OF DRIFTWOOD, PENNSYLVANIA.

BURNER.

1,032,811.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed February 1, 1911. Serial No. 605,857.

To all whom it may concern:

Be it known that I, JAMES O. BROOKBANK, a citizen of the United States, and a resident of Driftwood, in the county of Cameron and State of Pennsylvania, have invented a new and Improved Burner, of which the following is a full, clear, and exact description.

The invention relates to burners for cooking and heating stoves, and its object is to provide a new and improved burner for burning kerosene, coal oil, petroleum, gasoline or other liquid fuel, and arranged to permit of conveniently and quickly starting the burner, to prevent overflow of the liquid fuel in the burner and to prevent the escape of obnoxious fumes or odors into the room in which the burner is located.

For the purpose mentioned, use is made of a main burner having a vaporizing coil connected with a liquid supply and having a discharge nozzle which opens into the contracted outlet of an air chamber inclosing the coil and open at the bottom for the admission of air. A dome incloses the said air chamber and is spaced therefrom to form a mixing chamber, and the base end of the dome is provided with openings which open into a burner bowl extending outwardly and upwardly from the base end of the said dome. Use is also made of a preliminary burner for starting the vaporizing of the liquid fuel in the coil of the main burner to supply the latter with gas until the main burner becomes sufficiently heated to vaporize the liquid fuel.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a sectional side elevation of the burner, part being in elevation; and Fig. 2 is an enlarged sectional side elevation of the preliminary burner.

In Fig. 1 are illustrated two burners A and A', alike in construction and mounted on the upper ends of branch pipes B, B' of a liquid fuel supply pipe B<sup>2</sup> connected with an elevated tank C containing the liquid fuel. Although two burners A and A' are shown, it is evident that only one or more such burners may be connected with the tank C. The tank C is provided with a suitable filling cap D and a screen E is placed at the entrance to the supply pipe

B<sup>2</sup>, to prevent extraneous matter from flowing with the liquid fuel from the tank C into the supply pipe B<sup>2</sup>. Each of the branch pipes B, B' is provided with a manually-controlled cock B<sup>3</sup> for controlling the flow of the liquid fuel to the main burner A or A'.

Each of the burners A and A' consists essentially of a coil F terminating at its lower end in a pipe F' attached to the upper end of the corresponding branch pipe B or B', and the upper end of the coil F terminates in a nozzle F<sup>2</sup> which discharges into the upper contracted end G' of an air chamber G, open at its lower end G<sup>2</sup> for the entrance of atmospheric air to the chamber G. A dome H surrounds the air chamber G and is spaced from the same, and the lower or base end of the dome H is provided with minute openings H' which lead to a burner bowl I extending outwardly and upwardly from the lower end of the dome H. The coil F is in immediate contact with the inner surface of the wall of the air chamber G, so that the coil supports the said air chamber G, and when the burner is in use and the wall of the air chamber is heated then heat is transmitted to the coil F to vaporize the liquid fuel rising in the coil. The bottom of the bowl I is preferably integral with the lower end of the wall of the air chamber G, and an annular boss or shoulder I' rises from the bottom of the bowl I for engagement by the lower end of the dome H resting on the bottom of the bowl I. By the arrangement described the dome H is concentrically positioned relative to the air chamber G, and thus a mixing chamber is formed between the dome H and the air chamber G. The tank C is elevated so that it is approximately on a level with the coil F with a view to prevent the level of the liquid fuel from rising to the nozzle F<sup>2</sup> and overflow the same. The tank C is preferably provided with a removable cover, and the terminal of the pipe B<sup>2</sup> is provided with a screw cap to permit convenient cleaning of the tank C and pipe B<sup>2</sup>, respectively.

Below the main burner is arranged a preliminary burner for starting the vaporization of the liquid fuel in the coil F to supply the main burner with gas until the main burner becomes sufficiently heated to itself vaporize the liquid fuel. The preliminary burner consists essentially of a wick cup J centrally attached to the lower portion of the pipe F'. A wick K of asbestos or other

suitable material is placed in the wick cup J, and the liquid fuel in the pipe F' is adapted to flow into the wick cup J to saturate the wick K with the liquid fuel, the flow of the latter being controlled by a needle valve L controlling an aperture F<sup>3</sup> formed in the pipe F', as plainly indicated in Fig. 2. A perforate air supply tube N is fitted exteriorly onto the cup J and extends a short distance above the same to within a short distance below the base of the air chamber G, dome H and bowl I, as plainly indicated in Fig. 1. A burner cup O extends outwardly and upwardly from the base of the wick cup J and in the wall of the said cup screws the needle valve L, terminating at its outer end in a suitable handle L', for opening or closing the needle valve relative to the opening F<sup>3</sup>. When it is desired to start the burner the needle valve L is opened so as to allow the liquid fuel in the pipe F' to flow through the opening F<sup>3</sup> into the wick cup J to saturate the wick K, and then the operator lifts the perforate tube N to permit the application of a burning match to the wick K with a view to ignite the vapors rising from the saturated wick. The tube N is then returned to its position around the cup J. The flame emanating from the tube N heats the coil F as well as the air chamber G, dome H and the burner bowl I to such an extent that the liquid fuel contained in the coil F is readily vaporized, and the gas produced is discharged with force through the nozzle F<sup>2</sup> into the contracted outlet end G' and against the roof of the dome H, whereby a suction of air into the air chamber G is produced, and the air drawn in through the bottom G<sup>2</sup> passes with the gas through the contracted outlet G' into the mixing chamber formed between the walls of the dome H and the air chamber G. The gas and air are thoroughly mixed in the mixing chamber, and the mixture finally passes through the minute openings H' into the burner bowl I, where the mixture is ignited. It is understood that after the main burner is started the needle valve L may be closed, as the services of the preliminary burner are not further required. It is further understood that when the burner A or A' is in use the heat of the flame at the burner bowl I keeps the coil F sufficiently hot to vaporize the liquid fuel as the latter rises in the pipe F'. By causing the gases generated in the coil F to pass out of the nozzle F<sup>2</sup> under pressure, owing to the contracted form of the nozzle, it is evident that a suction action is produced in the air chamber G to draw in air for forming with the gas a mixture in the dome H, as previously explained.

The main burner and the preliminary burner are very simple in construction and composed of comparatively few parts, not liable easily to get out of order.

As previously stated, the overflow of the liquid fuel at the nozzle F<sup>2</sup> is prevented as the latter is above the top of the oil in the tank C, and as a proper mixture of air and gas in the dome H takes place, it is evident that complete combustion is had and consequently the burner is practically rendered odorless.

A very intimate mixture of air and gas is had in the dome H, as the air and gas pass through the contracted end G' under pressure and strike against the under side of the roof of the dome H so that the gas and air are deflected outwardly and then brought in intimate contact with each other to form a proper mixture, which finally issues through the openings H' into the bowl I to be burned.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A burner for liquid fuel, comprising a gas generating coil connected at one end with a liquid fuel supply and terminating at its other end in a discharge nozzle, an air chamber inclosing the coil and open at the bottom for the admission of air, the upper end being contracted, the said nozzle discharging into the contracted end, a dome inclosing the said chamber and spaced therefrom, the base end of the dome having openings, and a burner bowl extending outwardly and upwardly from the base end of the said dome and into which lead the said openings.

2. A burner for liquid fuel, comprising a gas-generating coil connected at one end with a liquid fuel supply and terminating at its other end in a discharge nozzle, an air chamber inclosing the said coil and supported by the coil, the air chamber being open at the bottom for the admission of air, the upper end being contracted, a burner bowl extending outwardly from the lower end of the air chamber and provided with an annular boss, and a dome set on the said boss and fitting on the said boss, the dome inclosing the air chamber and forming with the same a mixing chamber, the lower end of the said dome being provided with minute outlets opening into the bowl.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES O. BROOKBANK.

Witnesses:

GEO. L. SMITH,  
AGNES MACDONALD.