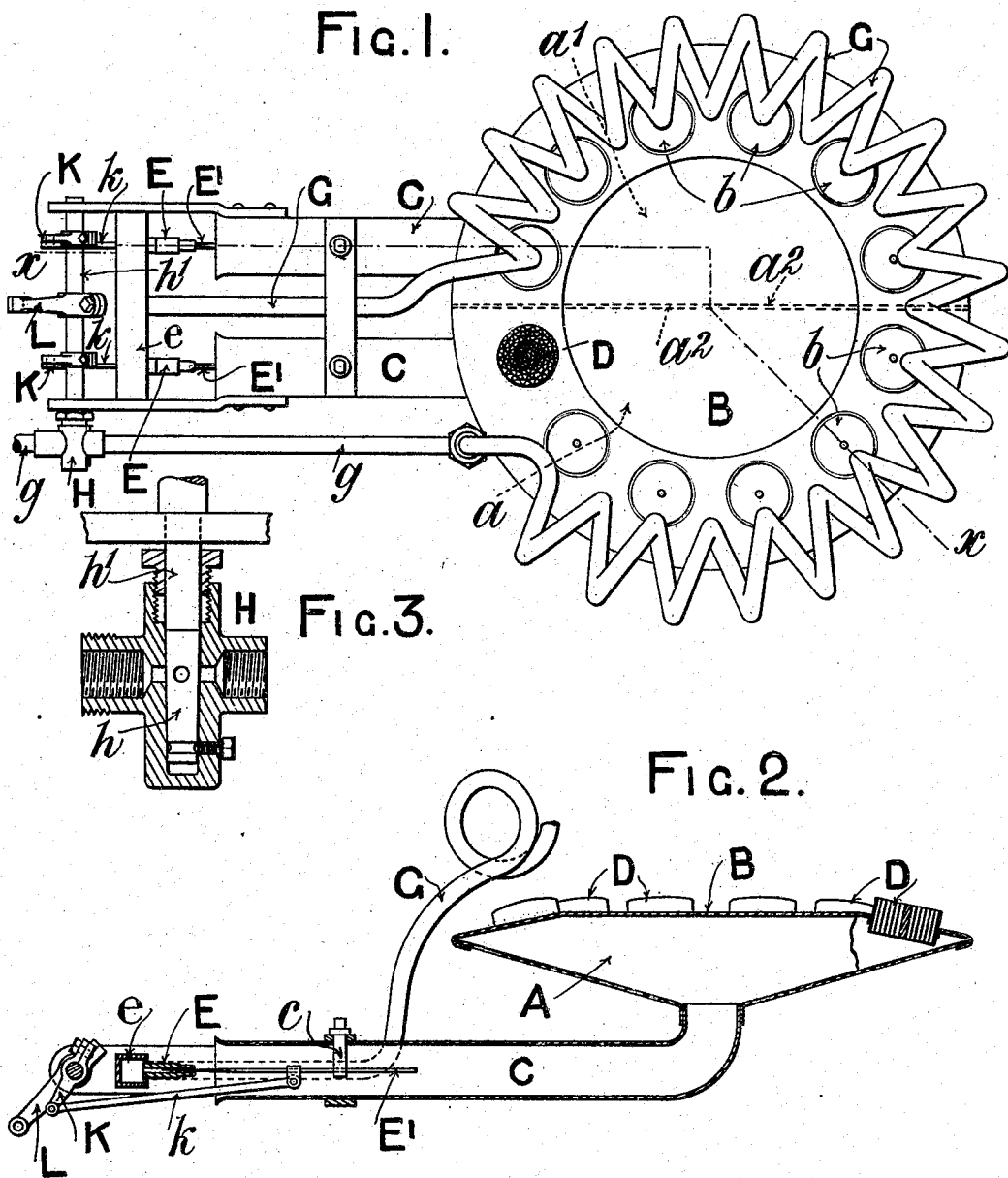


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LIQUID FUEL BURNER.
APPLICATION FILED NOV. 28, 1908.

930,568.

Patented Aug. 10, 1909.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM MORRISON SIMPSON, OF HASTINGS, ENGLAND, ASSIGNOR OF ONE-HALF TO JAMES BURNS DUMBELL, OF WOLVERHAMPTON, ENGLAND.

LIQUID-FUEL BURNER.

No. 930,568.

Specification of Letters Patent.

Patented Aug. 10, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM MORRISON SIMPSON, a subject of the King of Great Britain and Ireland, and residing at 41 Elphinstone road, Hastings, in the county of Sussex, England, have invented a new and useful Liquid-Fuel Burner, of which the following is a specification.

My invention relates to improvements in liquid fuel burners in which the oil is delivered to the vaporizer under pressure and the air to mix with the vapor is caused to flow by induction as in a burner of the atmospheric or "Bunsen" type.

The objects of my improvement are to cause the vapor to issue from the nozzle of the vaporizer at a constant velocity irrespective of the quantity of oil admitted into the vaporizer, secondly to produce a burner that will consume a large quantity of fuel for its size, thirdly to produce a burner that is noiseless and that will not smoke, fourthly to produce a burner which will give the same quality of flame irrespective of its size, and fifthly to produce a burner that will burn steadily and regularly when turned down. I attain these objects by the construction illustrated in the accompanying drawing in which:—

Figure 1 is a view in plan of the complete burner, Fig. 2 is a view in section on line $x x$ Fig. 1 and Fig. 3 is a view in section—on an enlarged scale—of the fuel valve.

Throughout the views similar parts are marked with like letters of reference.

The mixing chamber A of the burner comprises a chamber—of an inverted cone shape—preferably circular in form as shown, though it may be of rectangular or any other form without departing from the spirit and scope of this invention, divided into two compartments a and a^1 by a partition a^2 . The top of this chamber is closed by a plate of a cone shape B in which are a series of holes b —preferably, though not necessarily, of circular shape—arranged at a convenient distance from the edge of the mixing chamber A. In each of the holes b is placed a rose D having a number of small holes or passages forming a honeycomb rose burner of considerable depth through it. A convenient method of constructing these roses is to take two strips of metal, one plain and the other corrugated, and after laying them one on the other to roll them tightly up until the roll reaches such a size that it can be placed

in the hole in the plate B when the natural expansive elasticity of the roll of metal will suffice to hold it in place, though it may be mechanically fixed if desired. Into each of the compartments a and a^1 is led an induction tube C, the construction and arrangement of each being identical.

At a convenient distance from the free end of each of the tubes C is located a vapor nozzle E, the orifice of which is provided with a regulating needle valve E^1 . This needle valve is mounted in a suitable guide c mounted in the interior of the tube C. The two nozzles E are mounted on a common chamber c into which the vaporizing tube G is led. This vaporizing tube is arranged in the form of a coil over the roses D and its other end is connected by a pipe g with the source from which the liquid fuel is supplied under pressure. The coils of the pipe G are so arranged with respect to the roses D that those nearest to the source of supply are less exposed to the action of the flames from the roses than those most remote therefrom so that the coils get hotter and hotter as they pass over the burner.

In the supply pipe g is a valve H of the plug type, the plug h of which is extended to form or is connected to a shaft h^1 supported in suitable bearings. On this shaft are fixed two arms K K each of which is connected with one of the needle valves E^1 by means of a link or rod k . Suitable means such as an arm L is provided for rocking the shaft h^1 , the arrangement of the plug valve H and the needle valves E^1 E^1 being such that as the valve H is closed the opening of each of the nozzles E is reduced and vice versa.

In burners of a small size only one induction tube may be employed, in which case the mixing chamber A is not divided by compartments and in some cases the said mixing chamber may consist of a small compartment when two or more induction tubes are employed.

By constructing the mixing chamber and the roses as described the velocity of the vapor through the roses is increased which causes the flame to burn at a greater distance from the roses and thereby tends to keep the roses cool and prevents them from clogging.

By making that part of the vaporizer pipe over the burner of a spiral form the length of pipe exposed to the hot gases can easily be varied either by setting the coil more or less

over the roses or by putting the turns nearer together or spreading them farther apart.

What I claim as my invention and desire to secure by Letters Patent is:—

- 5 1. In a liquid fuel burner the combination of a double cone-shaped mixing chamber a series of rose burners located in the top plate thereof, a coiled vaporizing tube located above said rose burners, an induction tube opening into said mixing chamber, a nozzle 10 connected to the vaporizing tube and discharging into said induction tube, a needle valve for regulating the size of the orifice of said nozzle, a supply pipe connected to the 15 vaporizer and a valve in said pipe for controlling the quantity of oil passing into the vaporizer, a direct coupling between the fuel valve and the nozzle valve, and means for operating said coupling, as set forth.
- 20 2. In a liquid fuel burner the combination of a double cone-shaped mixing chamber divided into two compartments, a series of rose burners located in the top plate of said mixing chamber, a coiled vaporizing tube located above said rose burners, two induction 25 tubes each leading into one of said compartments, a fuel nozzle for each of the induction tubes and connected to the vaporizing tube, a needle valve for regulating the area of the 30 orifice of each of said nozzles, a supply pipe

connected to the vaporizer and a valve in said pipe for controlling the amount of oil passing to said vaporizer, a direct coupling between the fuel valve and the nozzle valves, and means for operating said coupling, as set 35 forth.

3. In a liquid fuel burner the combination of a mixing chamber having a series of rose burners, a plurality of induction tubes, a 40 coiled vaporizing tube above said burners, fuel nozzles connected to said vaporizing tube and discharging into said induction tubes, needle valves for regulating the areas of the orifices of the fuel nozzles, said needle 45 valves being mounted to slide in the induction tubes, a supply pipe connected to the vaporizer and a plug valve in said pipe for controlling the amount of oil passing into the vaporizer, an extension on the plug of the 50 valve, a plurality of arms mounted on said plug and coupled to the needle valves in the induction tubes by rods or links, and means whereby said plug can be oscillated, as and for the purpose set forth.

In testimony whereof I affix my signature 55 in presence of two witnesses.

WILLIAM MORRISON SIMPSON.

Witnesses:

A. MILLWARD FLACK,
G. V. SYMES.