

No. 709,579.

Patented Sept. 23, 1902.

A. KÖHLER.

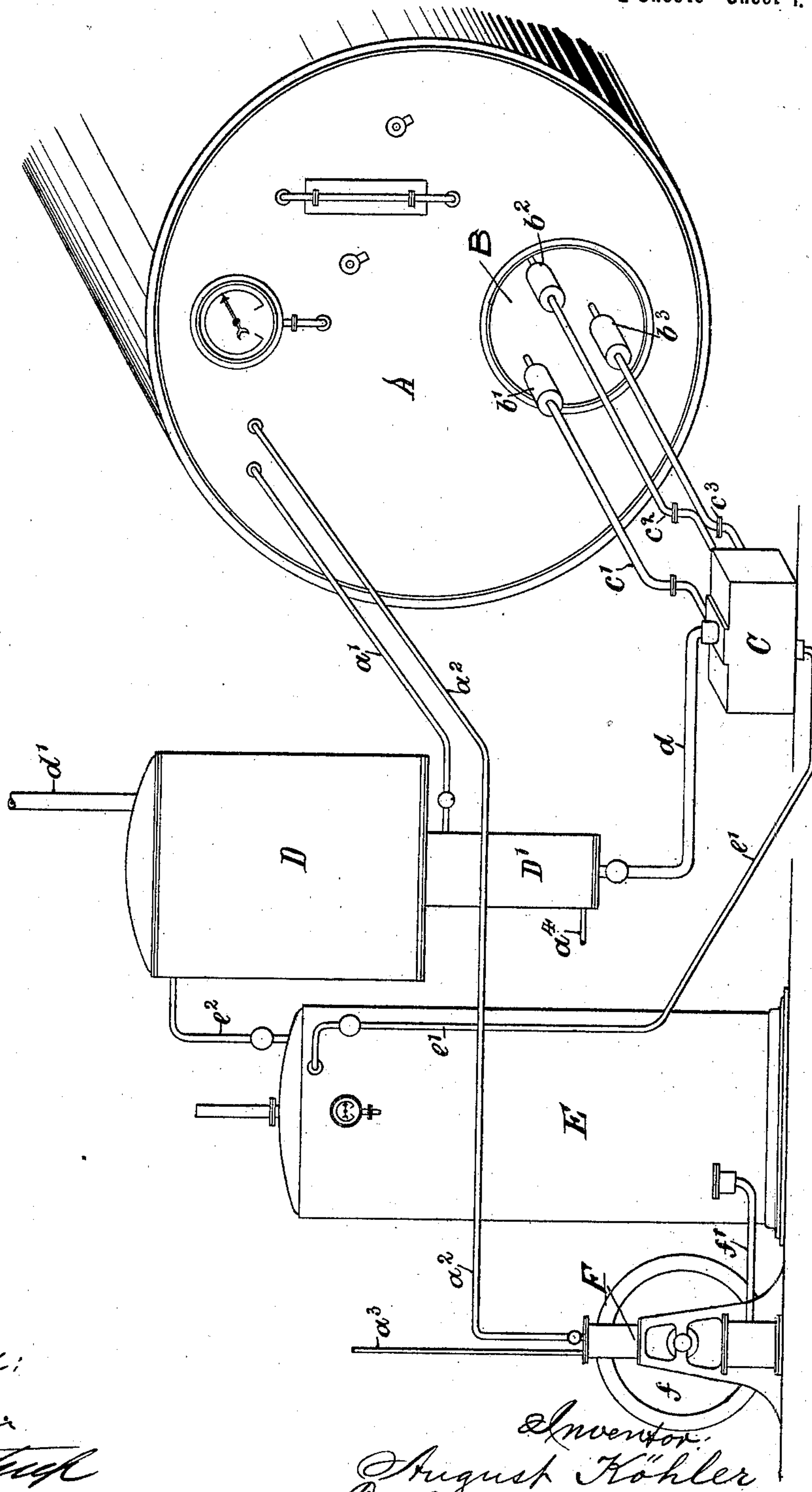
APPARATUS FOR SPRAYING AND BURNING LIQUID FUEL.

(Application filed May 23, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1



Witnesses:

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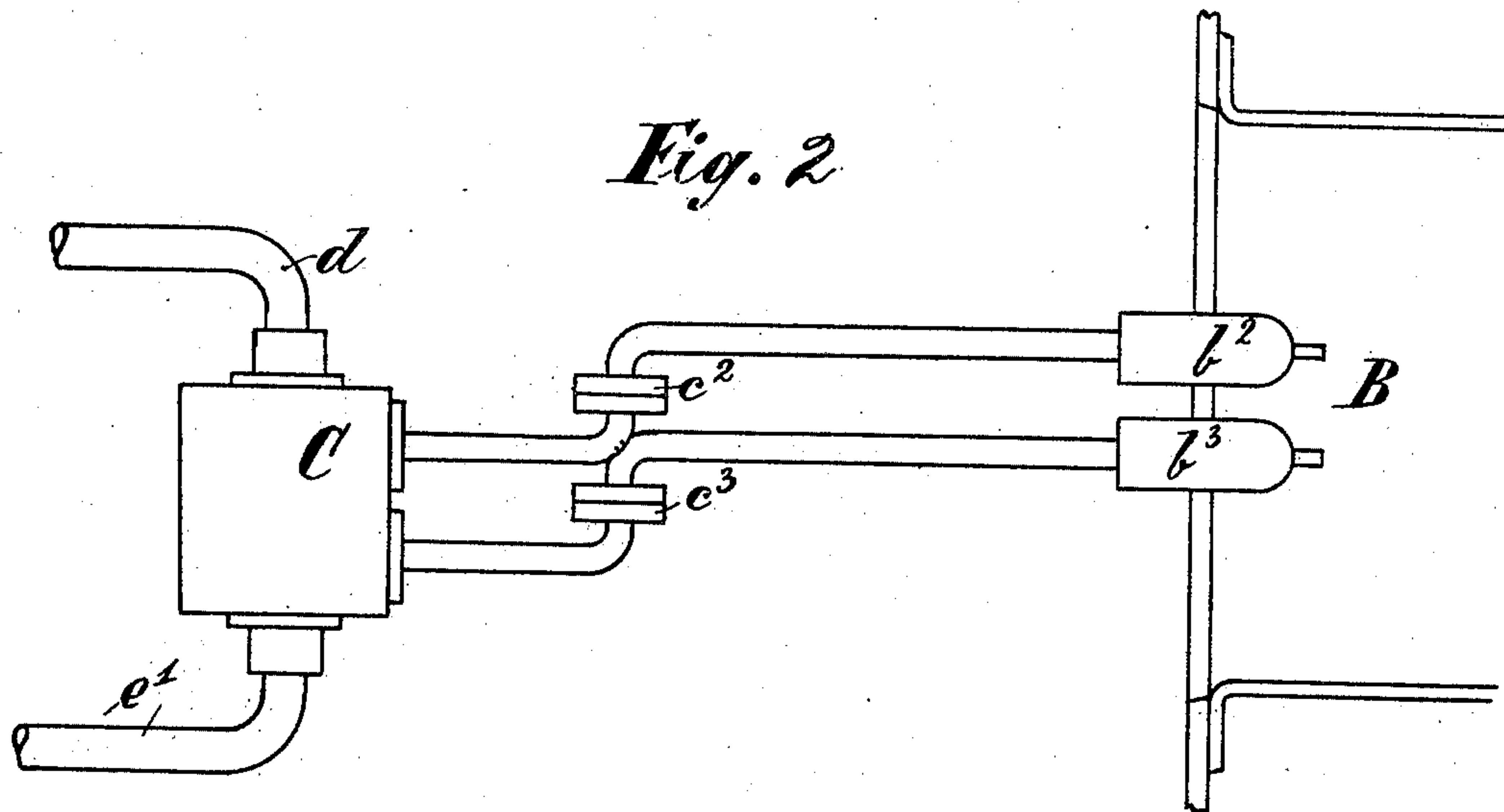
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(No Model.)

2 Sheets—Sheet 2.



*Witnesses*

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# UNITED STATES PATENT OFFICE.

AUGUST KÖHLER, OF HAMBURG, GERMANY.

## APPARATUS FOR SPRAYING AND BURNING LIQUID FUEL.

SPECIFICATION forming part of Letters Patent No. 709,579, dated September 23, 1902.

Application filed May 23, 1900. Serial No. 17,634. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST KÖHLER, engineer, a subject of the Emperor of Germany, residing at 17 Beethovenstrasse, Hamburg, Germany, have invented certain new and useful Improvements in Apparatus for Spraying and Burning Liquid Fuel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for spraying and burning liquid fuel, such as petroleum residue, whereby the liquid fuel is reduced to the form of spray by means of a burner through the action of a current of air under pressure. The burner effects a thorough mixing of the liquid fuel with the current of air, so that after the mixture leaves the nozzle of the burner an exceedingly powerful combustion takes place, with extraordinary heating effect and a non-illuminating flame.

In the accompanying drawings, Figure 1 is a perspective view illustrating the application of my invention to a horizontal boiler. Fig. 2 is a side view illustrating the arrangement of the burners, burner-pipes, and distributing-box.

The steam-boiler A is furnished with an ordinary fire-tube B, which may be partially or entirely closed in front. Into this fire-tube, which may be lined with fire-brick or other suitable material, one or more burners  $b'$ ,  $b^2$ , and  $b^3$  project. The burners consist of tubes inserted one within the other, the outer and inner of which are supplied with air under pressure, while the middle tube conveys the petroleum residue or other liquid fuel. In addition a stream of carbureted air—for example, gasoline mixed with air or the like—may be fed to the opening of the burner for the purpose of facilitating the ignition of the mixture of fuel and air.

The burners  $b'$ ,  $b^2$ ,  $b^3$  are seated in double tubes, which can be turned at the points  $c'$ ,  $c^2$ , and  $c^3$ , and which tubes lead from a distributing-box C, which is pivotally mounted on threads of two supply-pipes  $d$  and  $e'$ .

It will be noted that as the distributing-box can be turned between the pipes  $d$   $e'$  and as the burner-pipes are pivotally jointed at the

points  $c'$   $c^2$   $c^3$  the simultaneous turning of the box C and the burner-pipes causes the burners  $b'$   $b^2$   $b^3$  to be removed from the fire-box.

In the distributing-box C the tubes  $d$  and  $e'$  branch off to the different concentric tubes forming the burners  $b'$   $b^2$   $b^3$ . The tube  $d$  supplies petroleum residue or other liquid fuel and the tube  $e'$  supplies air. Near the fire-box B each of the burners  $b'$   $b^2$   $b^3$  is furnished with an air-valve and a valve for the liquid fuel. The tubes  $d$  and  $e'$  also have valves in suitable places.

D is the reservoir for the liquid fuel, which, like all such apparatus, may be placed at any suitable distance from the fireplace, as preferred. The reservoir D is furnished with a conduit  $d'$ , through which the petroleum residue or other liquid fuel can be pumped out of the main reservoir. The reservoir D is also fitted with a safety-valve and a gage-glass. A preliminary feed-heater arranged on the reservoir D is also desirable. By the preliminary heating of the liquid fuel the heating power of the latter can be considerably increased, especially as thereby the air of combustion is also preliminarily heated.

The air-reservoir E, which should be as large as possible, may have an air-tube  $e^2$  opening into the reservoir D, in order, in the case of forced heating, to force the liquid fuel with pressure into the tube  $d$ . The air-reservoir E is fitted with a safety-valve and a manometer. The air-pump F is arranged for working by hand or by steam from the boiler by means of the pipe  $a^2$ .

$a^3$  is the steam-outlet pipe.

Instead of the arrangement for working by hand a hot-air motor or the like may be employed. The pump F forces air into the air-reservoir E through the pipe  $f'$ , fitted with a non-return valve.

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

1. In an apparatus for spraying and burning liquid fuel, the combination with air and fuel reservoirs, and pipes leading therefrom, of a distributing-box having a pivotal connection with said pipes, tubes leading from the distributing-box, and burners carried at the opposite end of said tubes, each of said

tubes being pivotally jointed intermediate its respective burner and the distributing-box, as and for the purpose specified.

2. In an apparatus for spraying and burning liquid fuel, the combination with air and fuel reservoirs, and pipes leading therefrom, of a distributing-box arranged intermediate the outer ends of the said pipes and having a pivotal connection with said ends, tubes leading from the distributing-box at points to one side of the point at which said box is

pivoted, and burners carried at the other end of the tubes, each of said tubes being pivotally jointed intermediate its respective burner and the distributing-box, as and for the purpose specified. 15

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

AUGUST KÖHLER.

Witnesses:

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IDA HAUFERMANN.