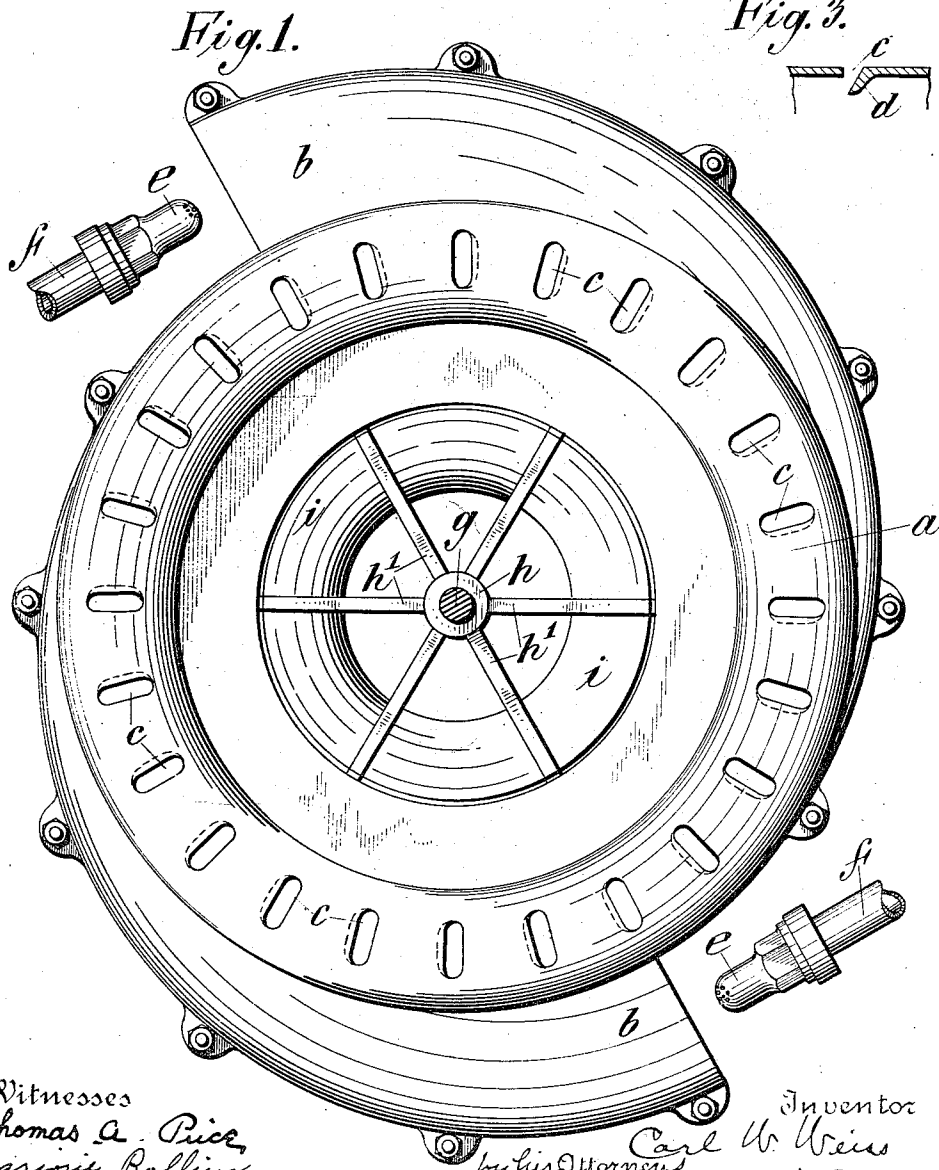
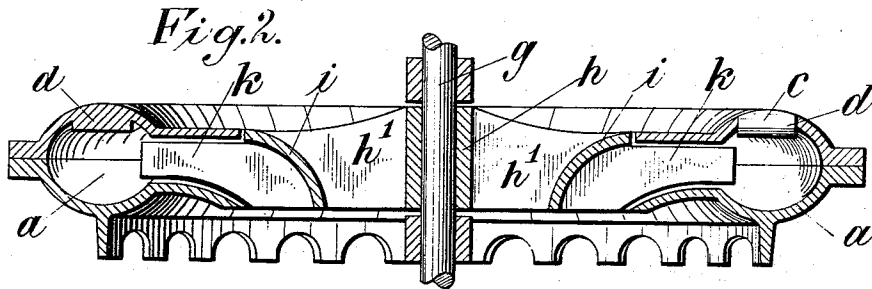


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 BURNER FOR LIQUID FUEL.
 APPLICATION FILED JULY 14, 1906.

966,628.

Patented Aug. 9, 1910.



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BURNER FOR LIQUID FUEL.

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Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed July 14, 1906. Serial No. 326,197.

To all whom it may concern:

Be it known that I, CARL W. WEISS, a citizen of the United States, residing in the borough of Brooklyn of the city of New York, in the State of New York, have invented certain new and useful Improvements in Burners for Liquid Fuel, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to burners for fuel oil in which the fuel oil is delivered in its liquid state to a spray jet where it is discharged in the form of fine spray and is thereafter ignited. In accordance with this invention the spray jet is directed into a flame guard in which ignition takes place and, after primary ignition, the spray is vaporized and complete combustion takes place, flame issuing from a flame port or flame ports in the flame guard. The spray is preferably discharged tangentially at one or more points into a substantially circular flame guard whereby an even pressure is maintained throughout the flame guard, the heat is distributed over a large surface, and a constant and rapid circulation of the primary flame is secured with the consequent continuous and uniform vaporization of the fuel oil, a perfect mixture of the gases and a uniform and complete combustion.

The invention will be more fully described hereinafter with reference to the accompanying drawings in which it is illustrated as embodied in a convenient and practical structure, and in which—

Figure 1 is a top view of the improved burner. Fig. 2 is a vertical section of the same, and Fig. 3 is a detail view showing one of the flame ports.

As shown in the drawings the burner comprises a substantially annular flame tube or guard *a* provided with one or more spray directing inlets *b* and, in its upper surface, with a plurality of ports *c* each of which is provided, at its remote edge, with a baffle plate or directing plate *d* projected downward into the flame guard and slightly inclined, as clearly shown in Fig. 3. Suitably located with respect to spray inlet *b* is a spray jet nozzle *e* at the end of an oil supply pipe *f* to which the fuel oil is supplied under pressure from any suitable source, not necessary to be shown herein.

As shown in the drawings a shaft *g*, centrally located with respect to the annular

flame guard *a* and adapted to be rotated by any suitable means, carries a hub *h* having arms *h'* between which the air can pass freely to mingle with the burning gases as they issue from the flame port, such arms supporting an annular flange *i* which is armed with fan blades *k* which deliver air to the flame guard *a*.

In operation the spray jet nozzle or nozzles *e* discharge oil spray under considerable pressure into the open mouths of the spray inlets *b*, the spray carrying along more or less air. The spray is ignited, primarily, by any suitable means, and thereby a flame is developed within the flame guard. Into this primary flame the spray is thereafter discharged and by it is completely vaporized and burned thereafter, under complete combustion, with an intensely hot and smokeless flame which issues from the flame ports *c*. As the spray jets enter the flame guard tangentially a constant rapid circulation of the primary flame is secured with continuous and uniform vaporization of the spray, a thorough mixture of the air and gases, and complete combustion. The burner operates satisfactorily for all ordinary purposes without the fan, but where it is desired to provide for the burning of a large amount of fuel in a given time in a comparatively small burner, the fan may be provided and made to rotate at high speed, supplying additional air and causing the flame to issue from the air ports with great velocity and to produce an intensely hot blast.

The operation of my burner does not depend upon nor require that the oil or air be heated prior to their being mixed, and I consider any avoidable heating of the air or oil before they enter the spray inlet *b* and flame guard *a* to be detrimental to the operation of my burner. I therefore avoid as far as possible the heating of the nozzles *e*, to which end I locate the nozzles *e* apart from, or isolate them from the spray inlet and flame guard as shown, so that as little heat as possible may flow from these parts, which necessarily become heated in operation, to the nozzles *e*. This feature, besides contributing to the operation of my burner as a whole, secures a nozzle which is not liable to become clogged with a deposit of carbon, which is a difficulty particularly liable to occur in burners having nozzles which are designed to be or which in fact are highly heated when the burner is in operation.

It will be understood that the details of construction may be varied as required to suit different conditions of use and that the invention is not restricted to the precise construction and arrangement shown and described herein.

I claim as my invention:

1. A fuel oil burner comprising an annular flame guard provided with tangential spray inlet and lateral flame outlet ports, means to supply oil under pressure in a liquid condition, and a spray jet nozzle to direct the oil spray under pressure tangentially into the flame guard.

2. A fuel oil burner comprising an annular flame guard provided with a tangential spray inlet port through which air and oil are supplied, and with lateral flame outlet ports, means to discharge additional air into

the flame guard, means to supply oil under pressure in a liquid condition, and a spray jet nozzle to direct the oil spray under pressure into the spray inlet.

3. A fuel oil burner comprising an annular flame guard provided with tangential spray inlet and lateral flame outlet ports, a fan mounted concentrically with the flame guard and discharging air into the same, means to supply oil under pressure in a liquid condition, and a spray jet nozzle to direct the oil spray under pressure into the spray inlet.

This specification signed and witnessed this 13th day of July, A. D. 1906.

CARL W. WEISS.

Signed in the presence of—

HOMER H. SNOW,
ELLA J. KRUGER.