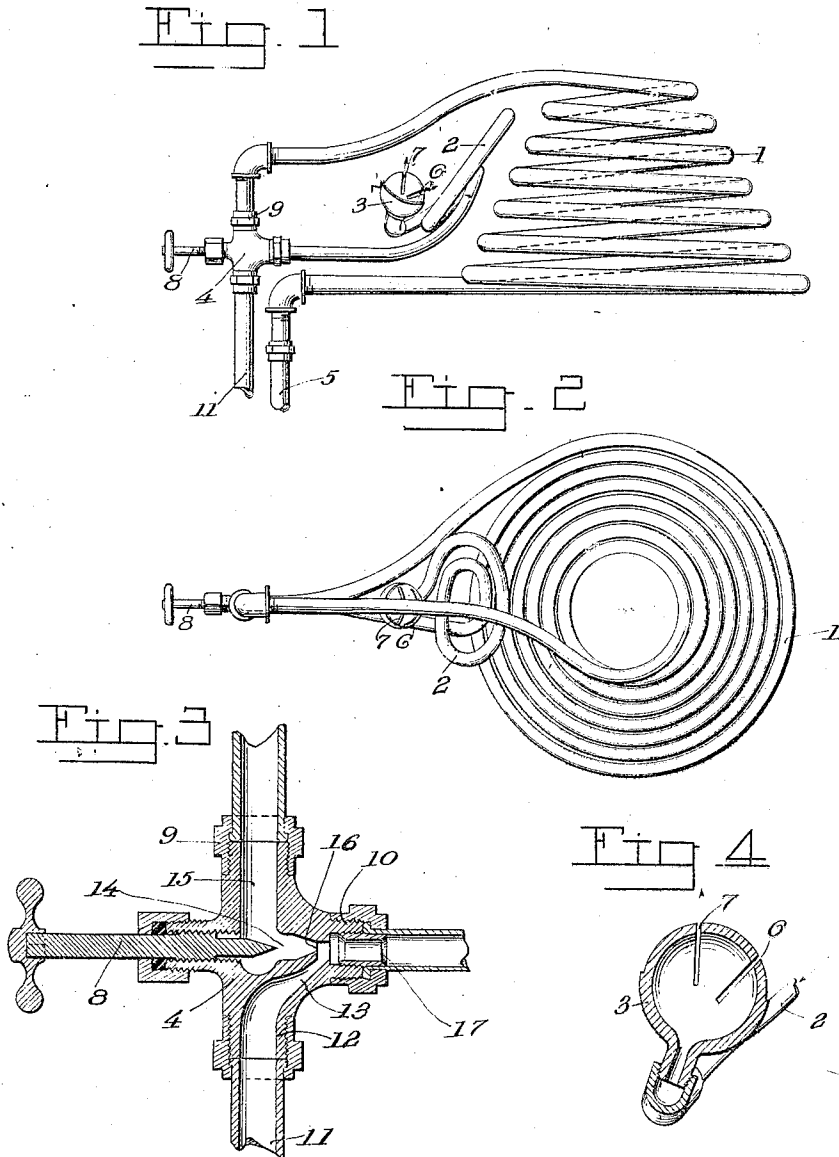


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LIQUID FUEL BURNER.
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1,041,649.

Patented Oct. 15, 1912.



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LIQUID-FUEL BURNER.

1,041,649.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM E. McCARTHY, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented new and useful Improvements in Liquid-Fuel Burners, of which the following is a specification.

The present invention provides a burner for use upon low pressure boilers or in places where steam is not readily obtainable for use in mixing with the hydrocarbon and feeding the same to the vaporizer.

The invention provides a burner which will generate steam to be used for feeding the hydrocarbon and mixing therewith to produce a gaseous fuel which will burn with a clear flame and be free from giving off any carbon.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawing, and pointed out in the appended claims.

Referring to the drawing, forming a part of the specification, Figure 1 is a side view of a liquid fuel burner embodying the invention. Fig. 2 is a top plan view thereof. Fig. 3 is a sectional view of the valved coupling. Fig. 4 is a sectional view of the burner.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the drawing, by the same reference characters.

The burner comprises a steam generating coil 1, a vaporizer 2, a burner tip 3 and a valved coupling 4.

The steam generating coil 1 is preferably of conical form and has its bottom coil connected with a feed pipe 5, which connects with any source of water supply. The top coil is connected with one end of the valved coupling 4 so as to supply steam thereto.

The vaporizer 2 consists of a coil of pipe or tubing, one end of which is provided with the burner tip 3 and the other end being connected to a branch or coupling end of the valved coupling 4. The vaporizer 2 is located near the steam generator 1 to admit of the latter deriving some benefit from the heat of the flame directed upon the vaporizer.

The burner tip 3 is of globular form and has two slots 6 and 7, each of the slots con-

sisting of a narrow cut and constituting an outlet for the gas. The slot 6 inclines toward the vaporizer 2 so as to direct a jet of flame thereon. The other slot 7 has an approximately vertical arrangement to throw a tongue of flame upwardly so as to heat the boiler or other part to be heated by a direct flame. In arranging the burner the steam generator 1 is placed to receive reflected or radiated heat, which ordinarily is sufficient to convert the water passing through the coil into steam.

The valved coupling 4 has four ends or branches, three of which have pipes connected thereto and the fourth receiving a needle valve 8. The upper part of the steam generating coil has connection with the coupling end 9. The vaporizer 2 has connection with the coupling end 10. A feed pipe 11 connects with the coupling end 12, said feed pipe leading to a source of liquid fuel, such as gasoline, crude oil, naphtha, or the like. The several coupling ends of the valved coupling have openings or passages. The passage 13 of the coupling end 12 is deflected and leads into a side of the passage 14 formed in the coupling end 10. The passage 15 formed in the coupling end 9 terminates approximately at the center of the valved coupling and connects with the inner end of the passage 14. A valve seat 16 is formed at the juncture of the passages 14 and 13 and is adapted to be closed by the needle valve 8. A nipple 17 is located within the coupling end 10 and is adjustable therein and overlaps the joint formed between said coupling end and the pipe attached thereto. The opening of the nipple 17 is flared at its inner end to more readily admit of the vapors passing therethrough. The nipple 17 forms a nozzle and is set into an enlargement of the passage 14. By adjusting the nipple 17 its inner end may be moved closer to or farther from the end of the passage 13 so as to regulate the injector effect.

In the operation of the burner steam from the generator 1 enters the valved coupling and passes through the passage 15, thence into the passage 14 through the nipple 17 and into the pipe connecting the vaporizer with the valved coupling. The steam in its travel through the passage 14 and nipple 17 creates a suction in the passage 13, which draws the liquid fuel through the pipe 11 from the source of supply, said fuel mixing

with the steam and becoming atomized thereby in its passage through the nipple 17 and passing to the vaporizer where the mixture is converted into gas preliminary to being burned at the outlets 6 and 7 of the tip 3. The opening between the passages 14 and 13 may be regulated by the needle valve 8 or completely closed as required.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention what is claimed as new, is:—

1. A liquid fuel burner comprising a steam generator, means for supplying water to the lower portion of the generator, a vaporizer arranged adjacent to the generator and having connection with the upper portion thereof, a burner having connection with the vaporizer and arranged with the vaporizer between the burner and generator, said vaporizer and generator being in proximal relation to the burner, a valved coupling in the connection between the vaporizer and upper portion of the generator, and a fuel pipe connected to said valved coupling.

2. A liquid fuel burner comprising a steam generator, a pipe leading from a

source of water supply and having connection with the lower end of the generator, a pipe leading from the upper end of the generator, a vaporizer adjacent to the generator, a burner tip having connection with one end of the vaporizer, a pipe leading from the opposite end of the vaporizer, a liquid fuel supply pipe, and a valved coupling joining the liquid fuel supply pipe and the two pipes leading from the upper end of the generator and from the said vaporizer, said coupling having passages communicating with the several pipes.

3. A liquid fuel burner comprising a steam generator consisting of a coil of conical form, means for supplying water to the lower end of the generator, a pipe leading from the upper end of the generator, a vaporizer arranged adjacent to the steam generator, a burner tip exterior to the vaporizer and having connection therewith and having outlets to direct a flame upon the vaporizer and generator as well as a flame in an upward direction, a pipe having connection with the vaporizer, a liquid fuel supply pipe, a coupling joining the liquid fuel supply pipe and the pipes leading from the vaporizer and generator and having inter-communicating passages and a valve seat at the juncture of said passages, and a valve threaded into the coupling for closing upon said seat and controlling the flow of steam from the generator.

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

WILLIAM E. McCARTHY.

Witnesses:

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