

1,045,779.

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UNITED STATES PATENT OFFICE.

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LIQUID-FUEL BURNER.

1,045,779.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM FALKENBERG, a citizen of the United States of America, and resident of Paris, France, have invented certain new and useful Improvements in Liquid-Fuel Burners, of which the following is a specification.

This invention relates to a vertical liquid fuel burning device in which liquid fuel such as kerosene or other oils is used, and said burner is especially intended for heating purposes, cooking, and steam boiler furnaces. The characteristic feature of said burner consists in that it is combined with a steam injector in order to increase the draft and to facilitate supplying and mixing the kerosene (or other) vapors with the air, thus securing a complete combustion of the fuel and a high efficiency of the burner.

The accompanying drawing shows a perspective view of the burner the shape and dimensions of which may vary, of course, according to the especial use to which said burner is to be applied.

In the drawing, 1, 2, 3 and 4 are tubular supports through which water and fuel and their respective vapors are conducted in the manner described more fully hereinafter. Said tubular supports are closed at their lower ends and support two superposed ring shaped tubes 5, 6. The upper annular tube 6 is fixed on the tops of the tubular supports 1, 2 and 4 while the lower, smaller one, is located between the tubes 1, 2 and 4 and rests on the tubular support 3 with which it is connected. The interior of said lower ring 5 communicates by means of a small connecting tube 7 with the interior of the support 1. The central space surrounded by the ring 5 is provided with a flat disk 8 which is secured to the lower peripheral surface of said ring. Below said disk 8 and axially disposed with respect to the same is provided the burner proper, which comprises a short vertical tube 9 closed at its lower end and communicates by means of the horizontal branch tube 10 with the tubular support 3. Centrally within the tube 9 is disposed a smaller tube 11 which is connected with a horizontal tube 12. Said tube is in turn connected at one end with the support 4 while its opposite free end 13 is closed. The tube 9 is surrounded by an air-supply duct made of two truncated cones 14, 15 connected together at their small ends. The funnel 14 is fixed to the horizontal tube 10

which maintains both truncated cones 14, 15 concentrically around the tubes 9 and 11 in such a manner that the juncture of said funnels is level with the upper end of the tubes 9 and 11.

The upper tubular ring 6 is provided with an inner vertical cross-partition 16 which is located between the tubes 2 and 4 while the lower ring 5 is provided with a similar partition 17 located between the tubes 7 and 3. The tube 1 is provided near its lower end with a feeding tube 18 and above said feeding tube with an interiorly arranged and upwardly directed nozzle 19. The tubular support 1 is closed above the tube 7 by a horizontal partition 20. The supporting tube 2 is provided near its lower end with a feeding pipe 21 above which is arranged, inside said support 2, an upwardly directed nozzle 22.

The above described burner works as follows: Ring 5 is preparatorily heated in some known way. Then the fuel is admitted through the tube 18. Said fuel rises into the tubular support 1 and flows through the horizontal tube 7 into the hollow ring 5 where it becomes vaporized. The burner is lighted and now it works further automatically, the heat of the burner's flame being transmitted to ring 5 directly as well as by conduction through the plate 8. The fuel vapors are prevented by the nozzle 19 from flowing back and flow through the support 3 and the tubes 10 and 9 into the burner proper. Owing to the partition 17, the fuel and its vapors are obliged to flow through substantially the whole length of the ring 5. On the other side the tube 21 supplies water, which rises through the tubular support 2 and enters the upper ring 6 in which it is vaporized and, after having traveled nearly through the whole ring, the steam escapes through support 4, horizontal tube 12, and vertical central tube 11 of the burner. The necessary air for the combustion of the fuel vapors enters the burner in the direction of the arrow 23 through the lower truncated cone 14. It is to be understood that, since steam escapes through tube 11, the latter acts as a spray nozzle, considerably increasing the draft of the burner and providing furthermore a thorough mixing of fuel vapors and air, this securing a complete combustion and increasing the efficiency of the burner.

Having now fully described my said in-

vention, what I claim and desire to secure by Letters Patent, is:

1. In a device of the character described, the combination of an annular tubular vaporizer, a plate disposed within the same and connected thereto, a burner located below the plate, whereby the flame is deflected around the outer edge of said vaporizer, means for supplying fuel to the vaporizer, means connecting the vaporizer and burner, an annular tubular member disposed above the vaporizer and of greater diameter than the same, means for supplying said member with water, and means for connecting said member and the burner.

2. In a device of the character described, the combination of a plurality of vertical tubular supports forming a frame for said device as well as the supply ducts for fuel and for water, a lower smaller hollow ring connected with said fuel duct, an upper hollow ring connected with said water duct, a burner on said tubular frame beneath both said rings comprising two concentrically disposed spaced apart pipes, a connection between the outer of said pipes and the lower ring, for supplying said pipe with fuel vapors, a connection between the central pipe of said burner and the upper ring for supplying steam to said central pipe, and two truncated cones concentrically disposed with respect to said burner, the small ends of said cones being joined at substantially the level of the upper ends of the burner pipes.

3. In a device of the class described, the combination of a plurality of vertical tubular supports forming a frame as well as supplying ducts for fuel and for water, nozzles located in said supply ducts for fuel and water, a lower smaller hollow ring connected with said fuel duct, a partition on the inside of said lower smaller ring adjacent the point where the fuel duct enters, a central plate secured on the bottom part of

said smaller ring for receiving the heat of the flame and transmitting the heat by conduction to said ring, an upper larger hollow ring connected with said water duct, a partition on the inside of said larger ring, adjacent the point where the water duct enters, a burner located below the central plate comprising two concentrically spaced apart pipes, a connection between the outer of said pipes and the lower smaller ring for supplying vapor thereto, a connection between the central pipe of said burner and the upper larger ring for supplying steam thereto, and two joined truncated cones concentrically disposed with respect to the said pipes, the meeting ends of said two truncated cones being substantially level with the upper ends of both pipes of the burner.

4. In a device of the character described, the combination of hollow supports, an annular tubular member at the upper portion of the hollow supports and communicating with one of the latter, a water supply pipe connected with the tubular support which communicates with the annular tubular member, an annular tubular vaporizer supported below the tubular member, a plate disposed within the annular tubular vaporizer, a fuel supply pipe connecting the annular tubular vaporizer and one of the supports, a burner located below the plate comprising two spaced apart tubes, a steam supply pipe connecting one of the tubes of the burner and the annular tubular member, a fuel supply pipe connecting the annular tubular vaporizer and the other one of the said burner tubes, and two joined truncated cones spaced from and surrounding the burner.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

WILLIAM FALKENBERG.

Witnesses:

GASTON PETIAN,
BARTLEY F. YOST.