F. C. RICHARDSON.

LIQUID FUEL BURNER.

APPLICATION FILED SEPT. 20, 1909.

947,943. Patented Feb. 1, 1910.

Fig. 1.

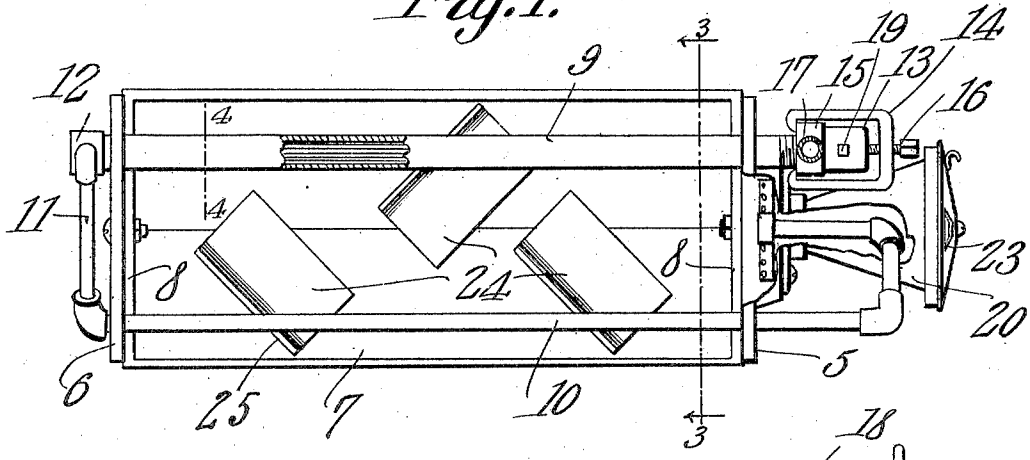



Fig. 2.

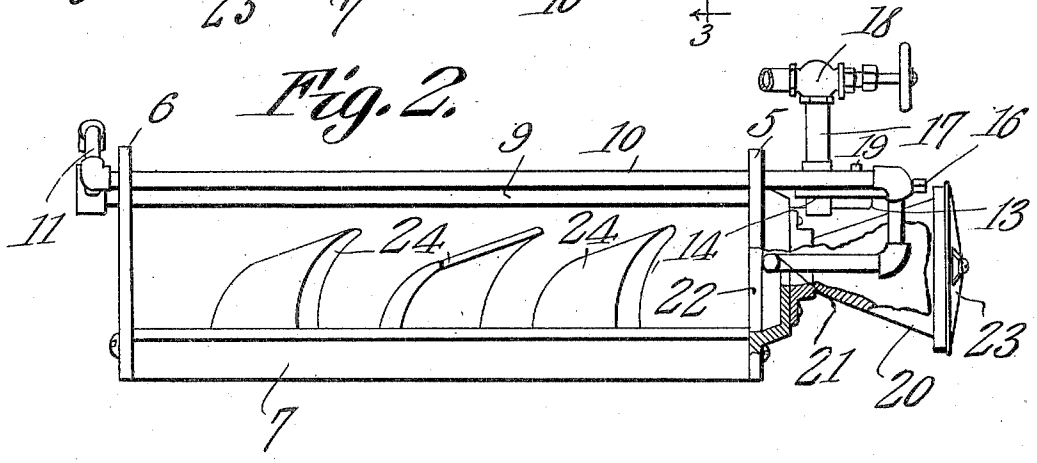
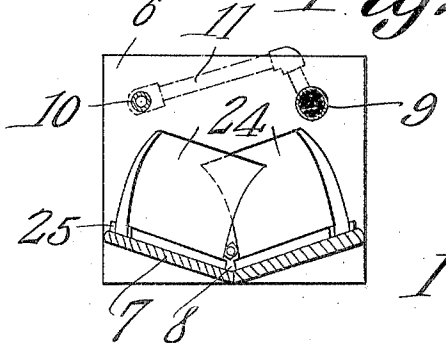



Fig. 3.



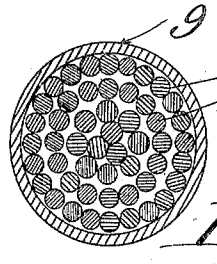




Fig. 4.

Frank C. Richardson, Inventor.

Witnesses

E. J. Stewart

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# UNITED STATES PATENT OFFICE.

FRANK C. RICHARDSON, OF IOLA, KANSAS.

## LIQUID-FUEL BURNER.

947,943. Specification of Letters Patent. Patented Feb. 1, 1910.

Application filed September 20, 1909. Serial No. 518,607.

*To all whom it may concern:*

Be it known that I, FRANK C. RICHARDSON, a citizen of the United States, residing at Iola, in the county of Allen and State of Kansas, have invented a new and useful Liquid-Fuel Burner, of which the following is a specification.

The burner which is the subject of the present invention belongs to that class in which gas or vapor is generated in a chamber which is located in close proximity to the flame of the burner.

It is the object of the invention to provide a vaporizing chamber so constructed that the liquid fuel will quickly vaporize, and also to provide means for superheating the gas or vapor in its passage from the vaporizing chamber to the burner.

With these objects in view, the invention consists in the novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the drawing hereto annexed, in which:

Figure 1 is a plan view of the burner; Fig. 2 is a side elevation partly broken away. Fig. 3 is a transverse section on the line 3—3 of Fig. 1. Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 1.

The supporting frame of the burner comprises front and rear walls 5 and 6, respectively, between which is mounted a shallow trough 7, said walls being bolted or otherwise secured to the end walls 8 of the trough.

Mounted in the walls 5 and 6, and extending therebetween, above the trough, and in the direction of its length, are pipes 9 and 10, respectively, there being openings in said walls through which the pipes pass, whereby they are supported. Behind the rear wall 6, the two pipes are connected by a cross pipe 11. The diameter of the pipe 9 is considerably greater than the diameter of the pipes 10 and 11, and a suitable reducer 12 is provided for connecting the pipe 11 to the pipe 9. The pipe 9 is the vaporizing chamber, and the pipe 10 is the superheater. In front of the wall 5, the pipe 9 is closed by a cap 13 held in place by a yoke 14, the branches of which are shaped to grip a collar 15 screwed onto the pipe. A set screw 16 is threaded through the yoke against the end of the cap, whereby the latter is securely held in place on the pipe, and at the same time the cap may be readily removed in order that access to the pipe may be had if it needs cleaning. A liquid fuel supply pipe 17, provided with a valve 18, is threaded through the collar 15, and enters the pipe 9. The cap 13 is fitted with a vent plug 19. The pipe 9 contains a plurality of rods 9ª of such a length as to extend throughout the entire length thereof. As many rods are placed in the pipe as it will hold. These rods serve to break up the liquid fuel flowing through the pipe into a plurality of fine streams, whereby a more rapid vaporization is effected. The rods can be readily removed for cleaning purposes, or otherwise, upon removal of the cap 13. The pipe 10, in front of the wall 5, enters a mixing chamber 20, and terminates therein in a nozzle 21. The mixing chamber is mounted over an opening 22 made in the wall 5, and the nozzle is presented in the direction of said opening, so as to discharge therethrough in the direction of the length of the trough. The mixing chamber is fitted with a damper 23 for controlling the amount of air passing to the nozzle.

In the trough 7 are deflectors 24 comprising wings which rise from the floor of the trough to the height of the opening 22, so as to intercept the flame issuing therefrom and deflect the same. The plates are set in grooves formed by parallel ribs 25 on the floor of the trough. The deflector plates 24 are located alternately on opposite sides of the center line of the trough, which is the deepest portion of the trough, and they also extend obliquely to said center line, and are curved forwardly from the bottom to the top, in the direction of the flame, so that said flame is deflected downwardly toward the floor of the trough. The position of the deflector plates relative to each other, is also such, that the flame will be deflected from one plate to the next, whereby it is caused to take a tortuous path through the trough, and thus spread over the same. The trough is located beneath the pipes 9 and 10, and the flame therefore furnishes the heat required for vaporizing the liquid fuel, vaporization being practically instantaneous by reason of the close proximity of the pipe 9 to the flame, and the finely divided state in which the fuel passes through the pipe. The vapor generated in the pipe 9, flows into the pipe 10 and is superheated therein, and discharged from the nozzle through the opening 22, a proper mixture of air and vapor being had by adjusting the damper 23.

The burner herein described is simple in

structure, and can be readily applied to any stove or furnace. It produces a large flame, and is economical in its consumption of fuel.

What is claimed is:

1. A liquid fuel burner comprising front and rear walls, the front wall having an opening, a trough between said walls, a mixing chamber mounted over the opening of the front wall, pipes mounted in said walls above the trough, a connection between the pipes, one of the pipes extending into the mixing chamber, a nozzle on said pipe discharging through the opening in the front wall, a fuel supply connected to the other pipe, and deflector plates rising from the trough to the height of the aforesaid opening in the front wall.

2. A liquid fuel burner comprising a trough, a vaporizing tube mounted above the same, and terminating in a nozzle discharging across the trough in the direction of its length, and deflector plates rising from the floor of the trough, said plates extending alternately in opposite directions from the longitudinal center line of the trough, and obliquely thereto.

3. A liquid fuel burner comprising a trough, a vaporizing tube mounted above the same, and terminating in a nozzle discharging across the trough in the direction of its length, and deflector plates rising from the floor of the trough, said plates extending alternately in opposite directions from the longitudinal center line of the trough, and inclined forwardly from the bottom to the top.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK C. RICHARDSON.

Witnesses:
J. B. Atchison,
E. L. Jackson.