T. B. JARVIES.

OIL BURNER.

APPLICATION FILED MAY 12, 1919.

**1,334,456.**

Patented Mar. 23, 1920.

2 SHEETS—SHEET 1.

*Fig. I.*

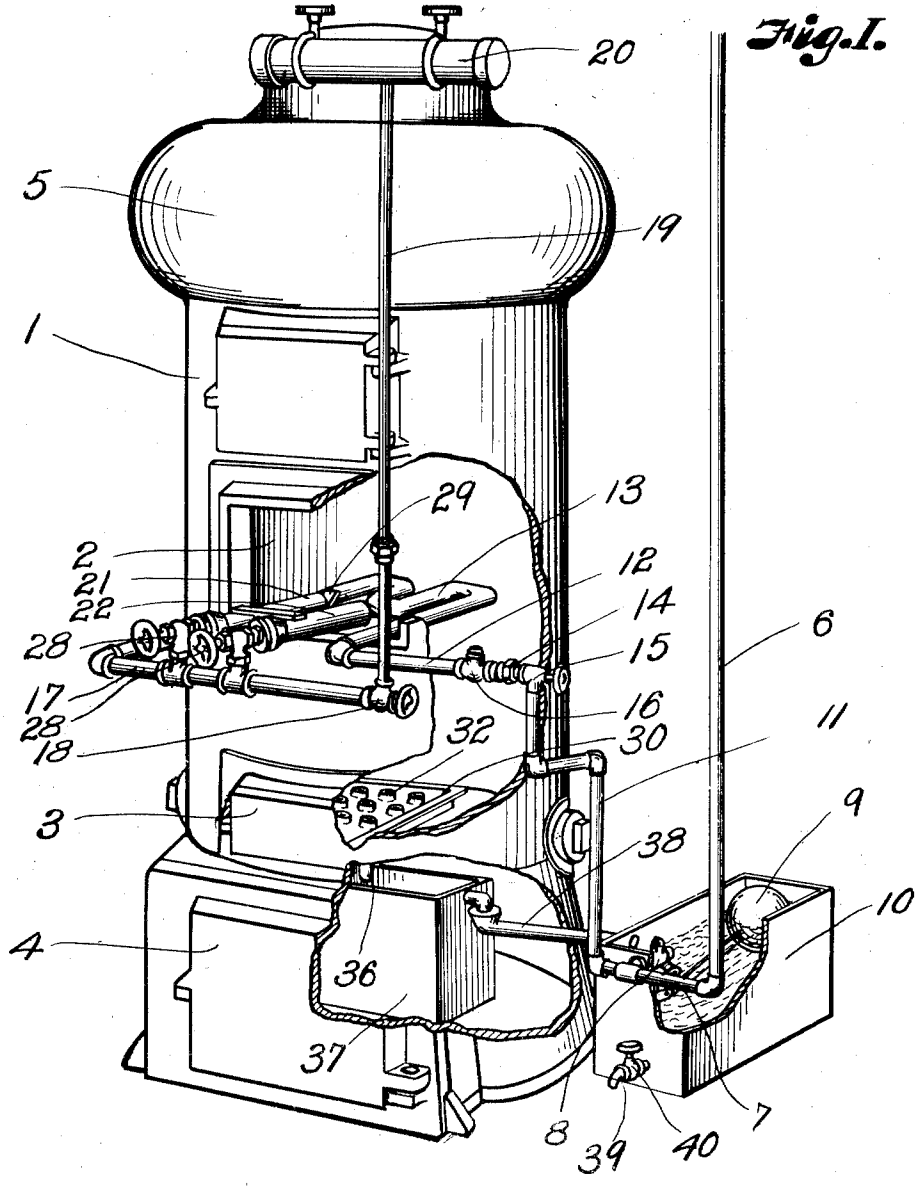
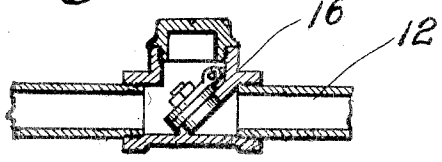



*Fig. II.*




Inventor

Thomas B. Jarvies.

By Arthur C. Brown

Attorney

T. B. JARVIES.

OIL BURNER.

APPLICATION FILED MAY 12, 1919.

1,334,456. Patented Mar. 23, 1920.

2 SHEETS—SHEET 2.

Fig. III.

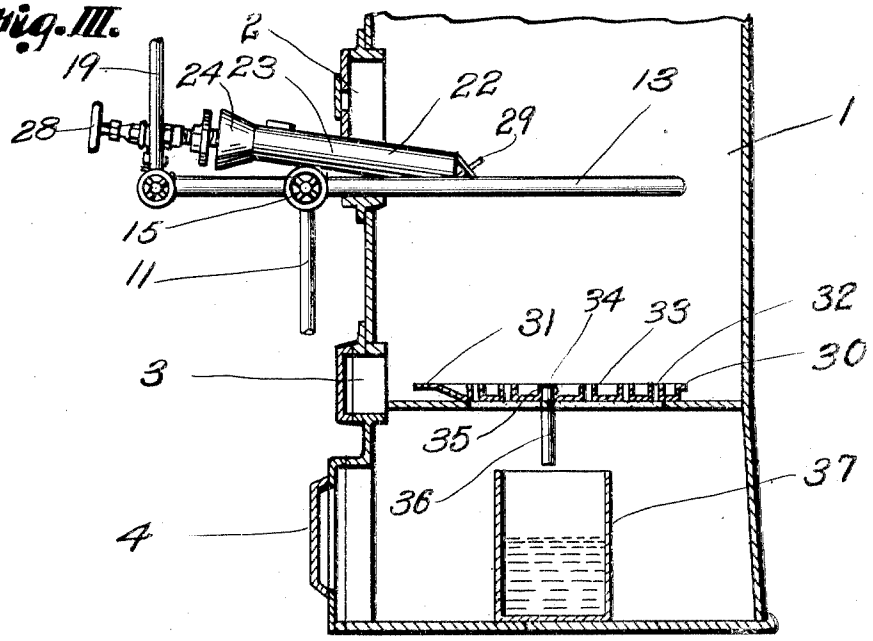



Fig. IV.

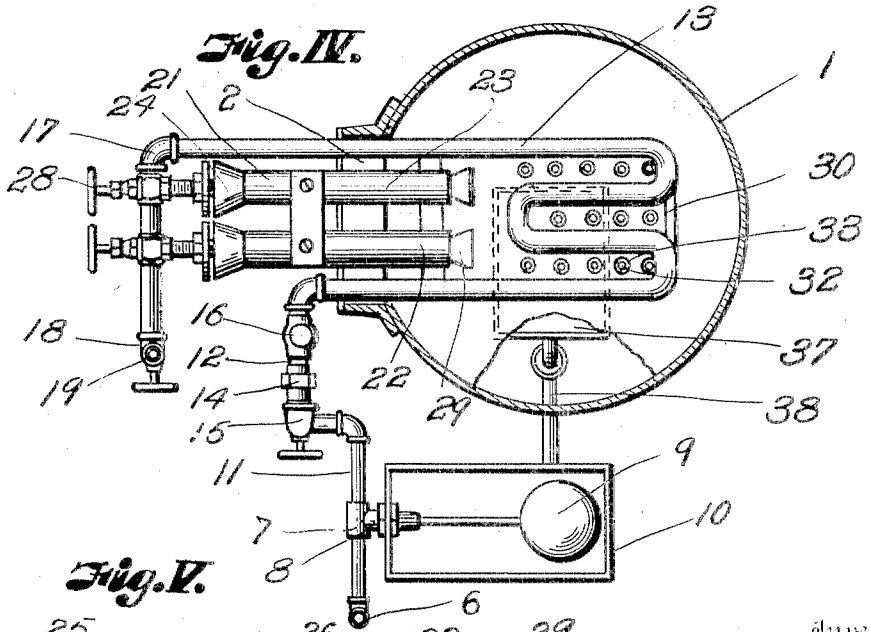
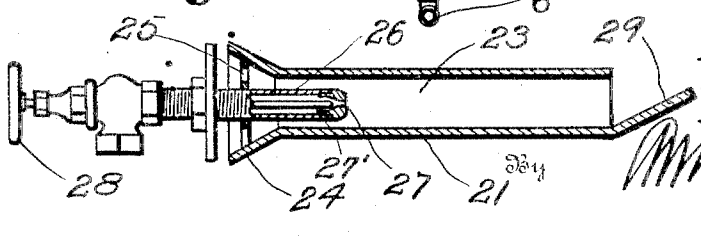



Fig. V.




Inventor

Thomas B. Jarvies

By

Attorney

# UNITED STATES PATENT OFFICE.

THOMAS B. JARVIES, OF KANSAS CITY, MISSOURI.

## OIL-BURNER.

1,334,456. Specification of Letters Patent. Patented Mar. 23, 1920.

Continuation in part of application Serial No. 253,703, filed September 12, 1918. This application filed May 12, 1919. Serial No. 296,443.

*To all whom it may concern:*

Be it known that I, THOMAS B. JARVIES, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Oil-Burners; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This application is a continuation in part of an application filed by me on or about September 12, 1918, Serial No. 253,703. The invention relates to furnaces and particularly to oil burners.

One of the objects of the invention is to provide a burner which may be associated with an ordinary coal burning furnace so that oil may be substituted for coal as a fuel without the necessity of materially changing the construction of the furnace.

Another object of the invention is to provide an oil vaporizing pan of approved construction for initially heating the vaporizing chamber of the burner, the pan being of such construction that it may be conveniently supported upon a coal grate support.

The invention also contemplates the provision of means for maintaining a constant pressure in the supply pipe for the oil burners and means is provided for cutting off the supply of fuel in the event that the burner is accidentally blown out while the control valve in the supply line is open.

It sometimes happens that high winds cause a down draft in the flue of the furnace with the result that the flame is blown out and after this occurs, with the ordinary type of burner, the fuel continues to flow with the result that the ash pit or chamber in the furnace base becomes flooded with the attendant disadvantages. It also happens that at times the valves for the burner nozzles do not close when the attendant attempts to shut them off because grit or dirt lodges between the valve and the valve seat. This also is liable to permit oil to seep through the burner nozzles and flood the lower part of the furnace.

According to my invention, any oil accidentally discharged through the furnace will be received within a receptacle in which there is a float-actuated valve adapted to cut off communication between the furnace and the source of supply so that liability of flooding will be avoided.

In the drawings,

Figure I is a fragmentary perspective view of a furnace equipped with an apparatus built in accordance with my invention.

Fig. II is a sectional view through a check valve in the supply pipe.

Fig. III is a fragmentary sectional view through the lower part of the furnace.

Fig. IV is a plan view of the burners and the float actuated valve tank, and

Fig V is a sectional view through one of the burners.

Referring now to the drawings by numerals of reference:

1 designates a furnace of the usual coal burning type provided with a fuel door opening 2, a grate door 3, an ash pit door 4, the heating zone being confined within the upper portion 5 of the furnace.

6 designates a supply pipe having a turn 7 in which is a valve 8 operated by a float 9 in a tank 10, the float operated valve being of any approved construction common to that type of devices. From the turn 7 a pipe 11 leads to a tubular member 12 of a horizontal coil 13, the pipe 11 and tubular member 12 being connected by a union 14 in which is a cut-off valve 15. The tubular member 12 is provided with an inwardly opening check valve 16 of approved construction, which has a tendency to open in the direction of the burner coil 13 when pressure is exerted on the right hand side thereof; when, however, a preponderance of pressure is exerted on the left hand side, the valve will close. The burner coil 13 is connected to a manifold 17 terminating in a valve controlled union 18, connected to a vertically extending pipe 19 communicating with a pressure reservoir 20 superposed above the coil 13. The manifold 17 is connected to the burners 21 and 22, each burner comprising a tubular member 23 having a flared portion 24 at one end, partially closed by a perforate air-admitting portion 25 which carries a tubular member 26 provided with a needle valve 27 so that the tubular member 26 is in

direct communication with the manifold 17. The tubes 26 are provided with valves 28 whereby the flow from the manifold through tubes 26 may be regulated. Each burner casing or tubular member 23 is provided with a tangentially extending outwardly-projecting lip 29 which serves as a deflector for directing the flame inclinedly from the discharge end of the casing 23. In the illustration, but two burners are shown, the lip in one being directed upwardly and the lip in the other being directed downwardly, as will be clearly apparent by reference to Figs. I, III and IV. The arrangement of burners is such that the flame will be caused to be directed above and below the coil 13 so as to vaporize the incoming oil before it is admitted to the burners through the manifold 17.

Below the burners and in line therewith is a combined drip and priming pan 30 having a circumferential flange 31 and openings 32 surrounded by flanges 33. The opening 34, however, is provided with a surrounding flange 35, the upper edge of which is slightly below the flanges 33 and this flange 35 is connected to an over-flow pipe 36 adapted to discharge into a tank or receptacle 37 in communication with the tank 10 through a conduit 38, the tank 10 being provided with a flow-off nozzle 39 adapted to be opened and closed by a valve 40.

When the parts are assembled, the oil may be fed from a superposed reservoir or under pressure to the pipe 6 through which it will flow through the turn 7, through pipe 11 into the manifold 17 and through pipe 19 to the reservoir or pressure chamber 20, it being understood that the valve 15 and valve coupling 18 are open to permit the oil to traverse the several pipes. If it is desired to start the furnace, the valves 27 will be opened to permit some of the oil to be discharged through the casing 23 on to the priming or drip pan 30. The fuel in the drip pan may then be ignited and combustion will be supported by air passing through the openings 32 so that heat will be generated to raise the temperature of the oil in the coil 13 so as to vaporize the same. When the proper vaporization has taken place, the fuel passing through the tubes 26 will induce air to pass through the openings in disks 25 to commingle therewith and permit combustion to take place at the discharge end of the casing 23, it being understood that the heat generated thereby in addition to heat from the burners will also supply sufficient heat to maintain a vaporizing temperature in the coil 13. Since the pressure chamber 20 is in direct communication with the tube 12, it will be apparent that when the pressure on the left hand side of the valve preponderates over the pressure on the right hand side thereof, the valve 16 will remain seated, but as soon as the pressure drops so that the pressure on the right hand side preponderates, additional oil will be permitted to pass through the openings for the valve 16 to the coil 13; therefore, a uniform pressure will be maintained within the coil 13 and a uniform flame will be provided for a given opening controlled by the valves 28.

In the event that the flame issuing from the burners is blown out or in the event that the valves 28 are left open, the oil will discharge through the burner casing on to the drip pan and because the upper end of the flange 25 is below the upper end of the flange 31, the oil will overflow into the receptacle 37 and from 37 pass through 38 into the tank 10. As soon as the level of the oil in the tank 10 reaches a predetermined height, the float 9 will be effective in closing the valve 8 in pipe 6 to cut off the supply of oil so that flooding in the lower part of the furnace will be prevented. The valve 27 may be provided with a needle point 27′ so as to have a tendency to maintain its orifice free from accumulated hydro-carbon or other fine substances.

When it is desired to shut off the supply of fuel to the furnace, the valve 15 may be manipulated manually and the valves 28 will remain open until the coil 13 is drained and then the valves 28 will be closed.

The float actuated valve could be controlled from the tank or receptacle 37 but for convenience I have located a communicating tank 10 outside of the furnace on account of accessibility thereto in removing accumulated oil.

What I claim and desire to secure by Letters-Patent is:

1. A fuel oil supply pipe, a manifold communicating therewith, a chamber superposed above the manifold and communicating therewith, burner nozzles having valved communication with said manifold, and a check valve in the pipe having opening movement in the direction of the manifold.

2. A fuel oil supply pipe, a horizontal coil communicating with said supply pipe, a manifold connected to the coil, burners connected to the manifold and having their discharge ends adjacent to the horizontal coil, a pressure chamber above the manifold in the coil, means for effecting communication between the chamber and the manifold, and a valve between the coil and the supply pipe having opening movement in the direction of the coil.

3. A fuel oil supply pipe, a vaporizing coil connected thereto, the coil being in a horizontal plane, a manifold connected to the vaporizing coil, burners connected to the manifold and extending in substantially horizontal planes with outlets for

directing the flame above and below the vaporizing coil, and a priming pan below the coil.

4. A burner for furnaces comprising a fuel oil supply pipe, a manifold, a pressure chamber superposed above the manifold and communicating with said manifold, a coil connecting the supply pipe with the manifold, and burner nozzles having valved communication with said manifold, said burner nozzles having outlets for directing the flame above and below the coil to preliminarily vaporize the fuel before it enters the manifold.

5. A fuel oil supply pipe, a horizontal coil communicating with said pipe, a manifold connected to the coil, burners connected to the manifold and having their discharge ends adjacent to the horizontal coil, a valve between the coil and the supply pipe having opening movement in the direction of the coil, and a chamber connected to the manifold for maintaining a constant pressure in the coil, the valve having opening movement when the pressure in the chamber drops below a determined value.

6. A fuel oil supply pipe, a vaporizing coil connected thereto, the coil being in a horizontal plane, a manifold connected to the vaporizing coil, and burners connected to the manifold and extending in substantially horizontal planes with outlets for directing the flame above and below the vaporizing coil.

7. A fuel oil supply pipe, a vaporizing coil connected thereto, the coil being in a horizontal plane, a manifold connected to the vaporizing coil, burners connected to the manifold and extending in substantially horizontal planes with outlets for directing the flame above and below the vaporizing coil, and a pressure chamber connected to the manifold for maintaining a constant pressure therein.

In testimony whereof I affix my signature.

THOMAS B. JARVIES.