

F. A. JACOBS.

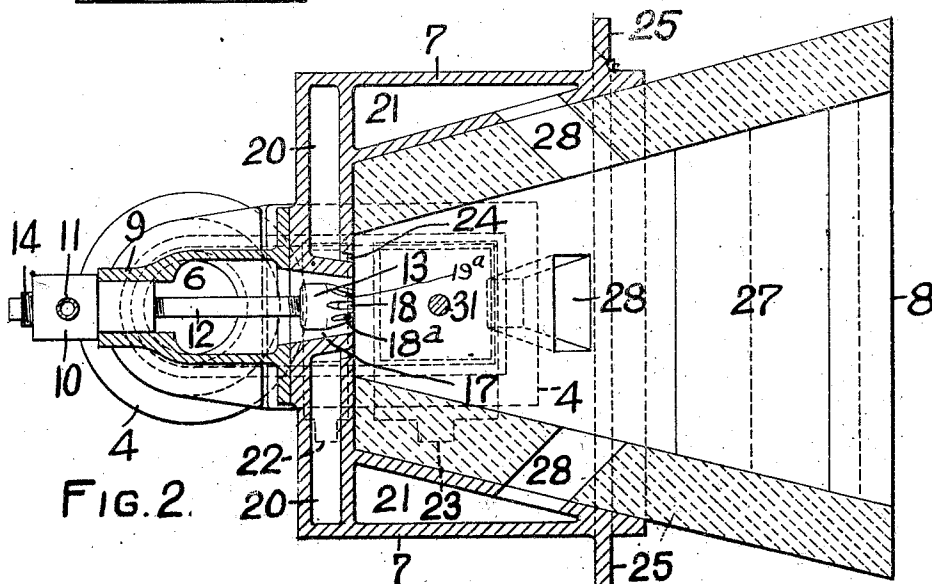
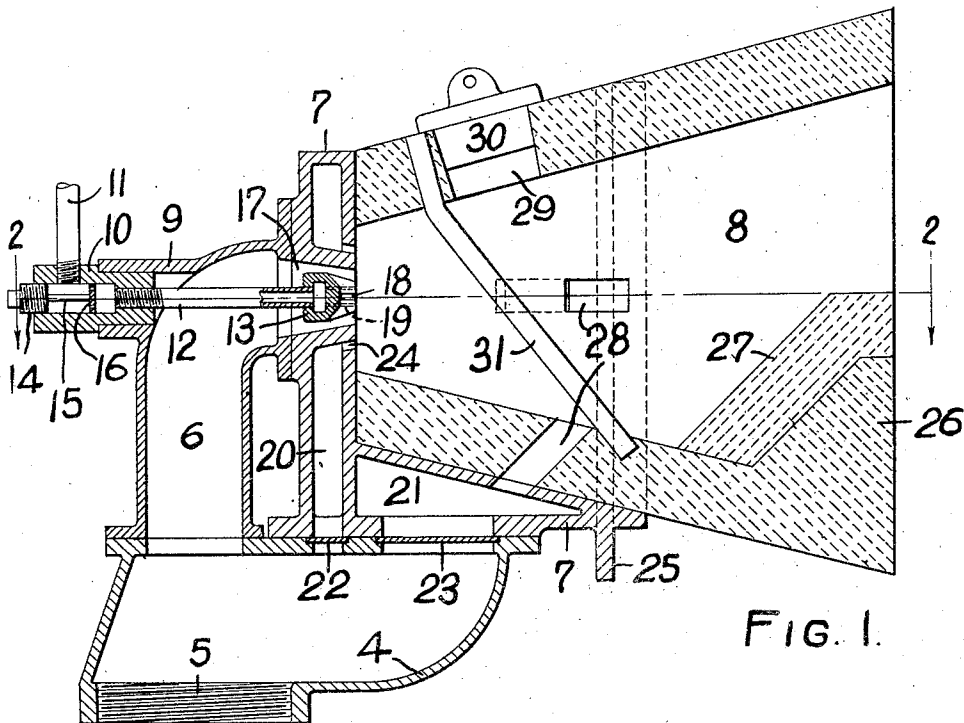
OIL BURNER.

APPLICATION FILED DEC. 22, 1911.

Patented June 3, 1913.

2 SHEETS-SHEET 1.

1,063,352.



Witnesses

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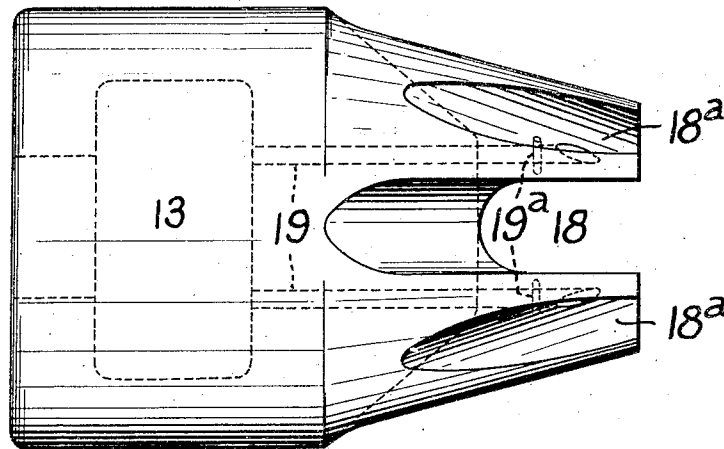


FIG. 3.

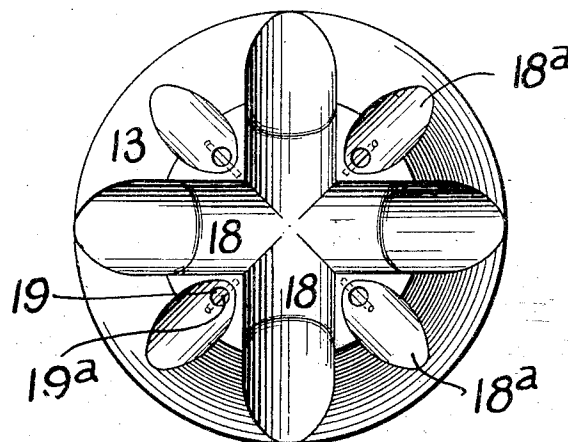


FIG. 4.

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UNITED STATES PATENT OFFICE.

FRANCIS A. JACOBS, OF MONTREAL, QUEBEC, CANADA.

OIL-BURNER.

1,063,352.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed December 22, 1911. Serial No. 667,409.

To all whom it may concern:

Be it known that I, FRANCIS A. JACOBS, of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Oil-Burners, and do hereby declare that the following is a full, clear, and exact description of the device.

This invention relates to improvements in oil burners and the main object is to provide a burner so arranged as to completely atomize the oil.

A further object is to provide means for thoroughly mixing the gas and air to thoroughly consume the spray and at the same time obtain a maximum of efficiency.

To accomplish these objects, I provide a burner adapted to discharge the fuel oil in a fine spray into the combustion chamber. As the oil enters the combustion chamber it is mixed with air under pressure, the air currents being so regulated and directed as to completely atomize the oil. This spray is then further mixed with heated air before passing to the flame.

In the drawings which illustrate this invention:—Figure 1 is a vertical sectional view of the burner and combustion chamber. Fig. 2 is a horizontal section in the line 2—2 Fig. 1. Fig. 3 is a side elevation of the burner. Fig. 4 is a front elevation of the burner.

Referring to the drawings, 4 designates a manifold to which the air pipe is connected at 5. Mounted on said manifold is the burner body 6 and a casing 7, which holds the combustion chamber 8 and forms the rear thereof. The burner body 6 is in the form of a vertical tube turned over at the top to a horizontal position as shown, and provided with a rearwardly extending branch 9 closed by a plug 10. This plug is hollow and serves as a connection between the oil supply pipe 11 and the burner tube 12, which latter extends forwardly and carries a tip 13. The rear of the plug is provided with a clean out plug 14 carrying at the end of a small rod 15 a strainer 16, said strainer being located between the oil pipe and burner tube. By means of this arrangement the strainer may be removed, thus cleaning out any sediment in the plug, without interfering with the adjustment or operation of the burner.

The burner tip 13 is hollow and slightly

tapered toward the front end to conform approximately to the taper of the aperture 17 in member 7, which it occupies. A plurality of radial slots 18 are cut in the burner tip, the bottom of said slots sloping rearwardly at the outer ends, as shown in Fig. 1. These slots 18 form the end of the burner into a plurality of small nozzles each of which is penetrated by a small passage 19 communicating with the hollow interior of the burner.

Extending up the sides of the tip are grooves or slots 18^a into which the oil passages open. Near the outlet these oil passages are passed by small pins 19^a, which have the effect of breaking up the solid jets of oil so that the same emerges in the form of a spray. Air rushing through the grooves 18^a carries the oil spray toward the center line of the burner where it is caught by the air current formed by air rushing through the converging slots 18.

The member 7, which is approximately rectangular in form and having inclined walls, is provided with double walls on the bottom, sides and rear, while the front and top are open. The double walls form passages 20 and 21, the rear passage 20 being entirely separate from the passage 21 which is continuous around the sides and bottom. Both passages are in communication with the manifold 4, the flow of air being regulated by sliding gates 22 and 23 respectively. The aperture 17 through which the burner passes is entirely isolated from the passage 20, but air from the passage escapes through an annular slot 24 surrounding the aperture and concentric therewith. The member 7 is provided near the front with flanges 25 by means of which it may be attached to the front of a furnace.

The combustion chamber 8 is frusto-pyramidal or frusto-conical in form, hollow and composed, preferably of fire brick. The chamber is arranged with its small end to the rear. The mouth of the chamber is closed at the lower half by a baffle or bridge wall 26, the upper surface of which is protected by a special removable brick 27. Forwardly sloping apertures 28 are provided in the sides and bottom of the combustion chamber communicating with the passage 21. At the top of the combustion chamber is a lighting aperture 29 which may be closed by a suitable plug 30 when not in use. Im-

mediately in front of the burner is a sloping rod 31 extending from the top of the combustion chamber to the bottom thereof in front of the bottom aperture 28. The purpose of this rod is to break up the oil spray and aid in atomizing the same.

The oil is forced under suitable pressure to the burner and emerges from the passages 19 in fine jets. The air from the manifold passes through the burner body 6 and passages 20 and 21. The air entering the burner escapes through the aperture 17, *i. e.*, through the annular passage left between the walls of the aperture and the burner. As this passage is considerably restricted the air attains great velocity so that on coming in contact with the oil jets it breaks the same up into a fine spray. This breaking up of the jets is further assisted by the air which blows into the slots 18 and centers in a forwardly moving blast between the oil jets. The air entering the passage 20 escapes through the annular aperture 24, and forms a cone of air around the oil jets which is caught and carried forward. The oil spray from the burner strikes against the rod 31 and is thereby thrown into the air core issuing from the aperture 24. This repeated mixing of the oil with air produces a resultant gas of very high thermal efficiency which burns with a clear smokeless flame. The air from the passage 21 enters the combustion chamber through the passages 28, and provides an additional supply of oxygen to insure perfect combustion. The updraft from the bottom passage 28 also tends to lift the flame above the bridge 26. It will be understood that after the burner has been in operation for a short time the combustion chamber and casing 7 become very hot, and that by passing the air through the passages 20 and 21 it is heated sufficiently to insure perfect evaporation of the oil and at the same time prevent the blast of cold air from striking the flame. The bridge wall throws the flame up and concentrates the same and also serves to stop particles of oil and soot, and prevent their entrance into the furnace. The purpose of sloping the rod 31 is that should liquid oil collect thereon and run down, it will not soak into the brick as it would if the rod were vertical, but will be evaporated in its passage down the rod by

the air emerging from the bottom aperture 28.

Having thus described my invention, I declare that what I claim is —

1. A device of the character described comprising a casing an air passage at the back of said casing, a combustion chamber supported by said casing, an air passage in the side of the combustion chamber for admitting air thereto, a burner body associated with the combustion chamber, a burner in said body, a deflector supported within said combustion chamber, and a baffle located in the mouth of said combustion chamber, for throwing the flame upward.

2. An oil burner comprising a body having a tapering outlet, a tip supported in said outlet whereby a tapering annular orifice is formed, said tip having a plurality of oil ducts spaced from the center thereof, means for heating air and a tapering annular orifice from said air heating means surrounding said first named orifice.

3. A device of the class described comprising a burner, a casing, an air passage at the back of said casing, a second air passage at the sides and bottom of the casing, a combustion chamber supported by the casing, an air manifold connected to said burner and passages, an annular orifice leading from the first passage into the combustion chamber at the rear, conduits leading from the second passage into the combustion chamber at the sides and bottom.

4. A device of the class described comprising a burner, a casing having air passages therein, a combustion chamber supported in said casing, an air manifold connected to said burner and air passages, an air inlet at the rear of the combustion chamber arranged to form a cone of air in front of the burner, means for throwing the oil from the burner into said air cone, air inlets at the sides and bottom of the combustion chamber, means for controlling the flow of air through said air inlets and means for concentrating the flame of combustion.

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

FRANCIS A. JACOBS.

Witnesses:

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