

J. WEINTZ.
OIL BURNER.

APPLICATION FILED SEPT. 27, 1907.

941,479.

Patented Nov. 30, 1909.

2 SHEETS—SHEET 1.

Fig 1

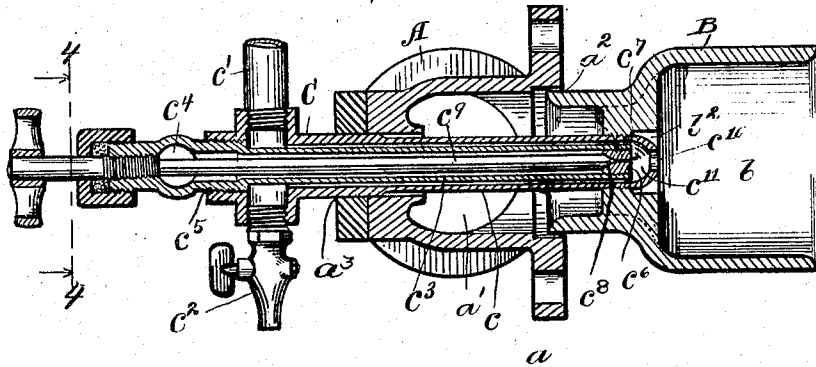
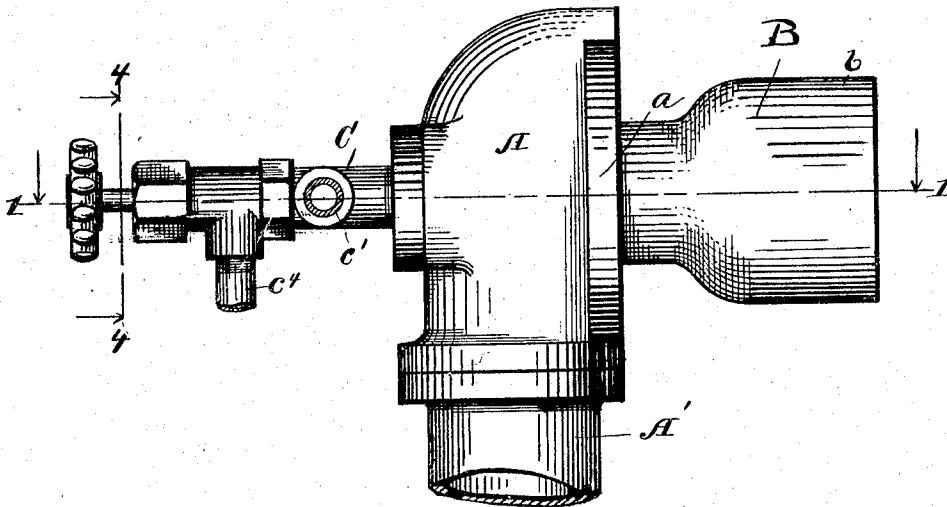


Fig 2



Witnesses

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Fig. 3

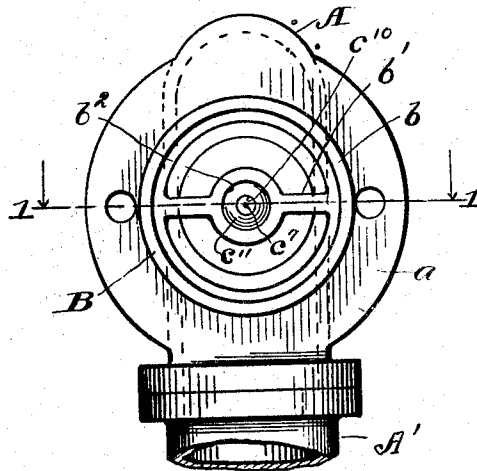
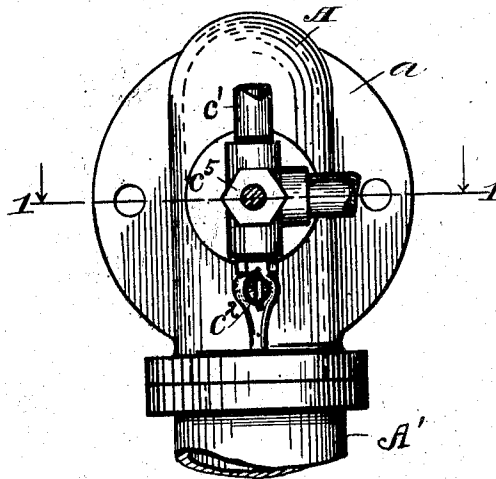


Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

JACOB WEINTZ, OF CLEVELAND, OHIO, ASSIGNOR TO THE STRONG, CARLISLE & HAMMOND COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

OIL-BURNER.

941,479.

Specification of Letters Patent.

Patented Nov. 30, 1909.

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To all whom it may concern:

Be it known that I, JACOB WEINTZ, citizen of the United States, resident of Cleveland, county of Cuyahoga, State of Ohio, have invented a new and useful Improvement in Oil-Burners, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

This invention relates to an improved form of burner for use in connection with melting and re-heating furnaces and the like. Said invention relates more particularly to burners of this type designed to employ a liquid fuel, for example, ordinary kerosene or other hydro-carbon oils; and it has as its object the provision of a burner that will be of simple construction and withal productive of a maximum heating effect for the amount of fuel consumed.

To the accomplishment of these and related objects said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings: Figure 1 is an axial cross section of a burner embodying my several improvements; Fig. 2 is a side elevation of such burner; Fig. 3 is a front elevation of the same; and Fig. 4 is a rear elevation, partly in section, thereof.

The base of a burner consists of a chamber A, formed with a flange a whereby it is adapted to be secured to the furnace wall, or wherever desired to employ the burner. This chamber consists preferably of a single integral casting and is provided with angularly related inlet and outlet openings a' a^2 , Fig. 1, for the passage of air therethrough, the opening a' being connected with this object in view to any suitable source of air supply by means of a pipe A' . Alined with the outlet opening a^2 of chamber A is another small opening a^3 for the insertion of the atomizer C, presently to be described, while loosely fitted in the outlet opening a^2 itself is a mixer B, that, like chamber A, is preferably composed of a single integral

casting. Such mixer is of general tubular form, terminating in a cup-shaped nozzle b and provided with a spider b' having a central aperture b^2 . Mixer B is retained in place in opening a^2 of chamber A by means of a short section of pipe or tubing c fitted in this aperture b^2 , the rear portion of which is similarly secured in the opening a^3 , such pipe c , constituting the outer shell of the atomizer C by means of which the liquid fuel designed to be employed in the burner is introduced in the mixer in proper form for its ready and complete combustion. Such outer pipe or tube c of the atomizer is connected with any suitable source, not shown, of air or steam, whereby such air or steam may be introduced under pressure into the atomizer, through a supply pipe c' . A drip cock c^2 oppositely disposed to such inlet pipe, permits of the withdrawal of any water such as might accumulate when steam is used owing to the condensation thereof. Mounted within air supply pipe c of the atomizer and terminating short of the discharge end thereof, is an oil supply pipe c^3 of somewhat smaller diameter. Such oil supply pipe has a suitable external connection c^4 as shown, and is held in proper place by having an enlarged portion c^5 threaded within the rear end of said air supply pipe. Inserted within the forward end of oil supply pipe c^3 is a plug c^6 having a central aperture c^7 that forms a discharge jet for the oil. The inner end of such opening is enlarged to form a conical valve seat c^8 for a needle valve c^9 , that is threaded in the rear end of said oil supply pipe and extends axially the entire length of the pipe. The forward portion of the air pipe that projects beyond the termination of said oil supply pipe is gradually drawn together or reduced in diameter, so as to form in front of the aperture c^7 in the plug c^6 a chamber c^{11} having inwardly curved walls and an opening c^{10} alined with such aperture c^7 .

The operation of the burner, thus structurally described in one approved form, should be readily apparent. By proper adjustment of needle valve c^9 , shown as being closed in Fig. 1, the admission of the oil into atomizer C, or rather its discharge therefrom, is easily and delicately controlled. From the forward end of the oil supply pipe this oil escapes in the form of a fine stream through aperture c^7 in plug c^6 .

The stream of air admitted into casing *c* of the atomizer through supply pipe *c'* is obviously of annular cross-section until it reaches such discharge end of the oil supply pipe. Here the converging walls of such casing force such stream inwardly so as to mingle the same thoroughly with the stream of oil from aperture *c'* as both streams make a common escape from chamber *c''* through the opening *c''* provided for this purpose. The oil is thus divided into minute particles and effectually atomized, so that a body of more or less gaseous character is produced. In the nozzle *b* of the mixer this body meets the air admitted through inlet opening *a'* of chamber *A* from main air supply pipe *A'* and is mingled therewith. The rate of supply of such air is of course regulated to provide a proper combustible mixture when the mixture is thus effected. The construction of the burner, aside from its simplicity, I have found to give an exceedingly hot flame suitable for use as a blast in the various operations involving the heating of metal parts both in exposed situations and in reheating furnaces, as also for the heating of crucibles and the like.

It has been indicated that this burner is not necessarily limited to the use of any particular kind of liquid fuel; in fact the plug *a*, through the aperture in which such liquid escapes, is purposely made removable and hence exchangeable with other plugs having apertures of different sizes. Accordingly wherever the word "oil" is used herein or in the following claims such term will be understood to include under the rule of equivalents, any suitable liquid fuel. The same statement is to be made in regard to the word "air" employed to designate the gaseous body used to vaporize the oil in the atomizer, as also the one employed to effect the final combustible mixture. In the first connection, particularly, other fluids such as steam, may be frequently substituted to advantage.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a burner of the character described, the combination of a main air supply pipe; a chamber directly connected with said air supply pipe; a mixer of general tubular form loosely fitting in said chamber, said mixer terminating in a cup-shaped nozzle and being provided with a spider having a central aperture; and an atomizer extending axially within said mixer, said atomizer

comprising an inner oil supply pipe provided with a jet discharge, and an outer air supply pipe surrounding said oil supply pipe, the respective ends of said air supply pipe being fitted in the rear wall of said chamber and in the central aperture of said mixer spider, thereby retaining said parts in place.

2. In a burner of the character described, the combination of a main air supply pipe; a chamber directly connected with said air supply pipe; a mixer of general tubular form loosely fitting in said chamber, said mixer terminating in a cup-shaped nozzle and being provided with a spider having a central aperture; and an atomizer extending axially within said mixer, said atomizer comprising an inner oil supply pipe provided with a jet discharge, and an outer air supply pipe surrounding said oil supply pipe and projecting beyond the discharge end of the same, the respective ends of said air supply pipe being fitted in the rear wall of said chamber and in the central aperture of said mixer spider, thereby retaining said parts in place, and such projecting portion of said air supply pipe being drawn together to form a small chamber in front of such jet discharge and having an opening in line therewith.

3. In a burner of the character described, the combination of a main air supply pipe; a chamber directly connected with said air supply pipe; a mixer of general tubular form loosely fitting in said chamber, said mixer terminating in a cup-shaped nozzle and being provided with a spider having a central aperture, and an atomizer extending axially within said mixer, said atomizer comprising an outer air supply pipe fitted in the rear wall of said chamber and in the central aperture of said mixer spider, thereby retaining said parts in place, an oil supply pipe of smaller diameter mounted within said air supply pipe and terminating short of the discharge end of the same so as to leave the latter project therebeyond, a plug, having a central opening forming a jet, inserted in the discharge end of said oil supply pipe, and a needle valve axially disposed within said oil supply pipe and adapted to control the aperture in said plug, the portion of said air supply pipe that projects beyond said oil supply pipe being drawn together to form in front of the aperture in said plug a chamber having inwardly curved walls and an opening in line with such aperture.

Signed by me this 21st day of September, 1907.

JACOB WEINTZ.

Attested by—

MARY ISRAEL,
JNO. F. OBERLIN.