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J. BRAGG.

OIL BURNER.

No. 409,556. Patented Aug. 20, 1889.

Fig. 1

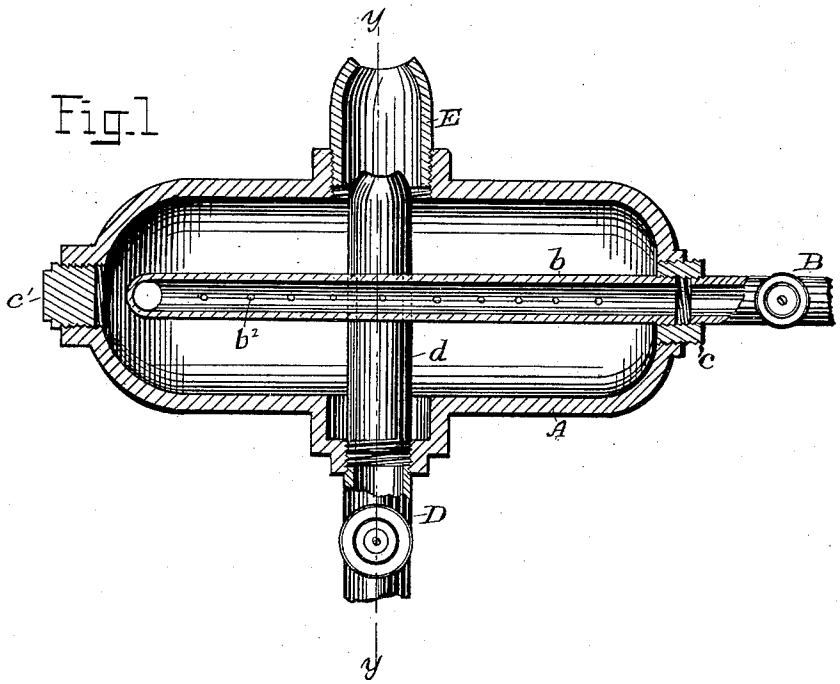
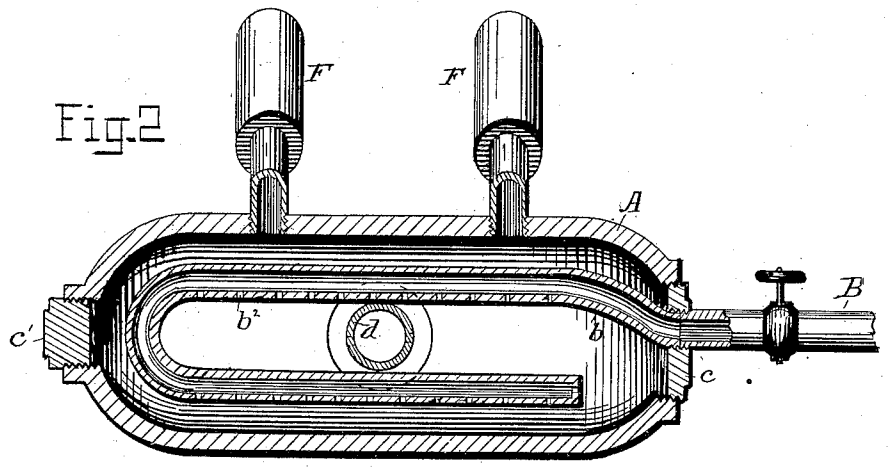


Fig. 2



Witnesses;

L. R. Vorce.

Alo Wales

Inventor;

John Bragg

by [illegible]

Atty

N. PETERS. Photo-Lithographer, Washington, D. C.

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J. BRAGG.

OIL BURNER.

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Fig. 3

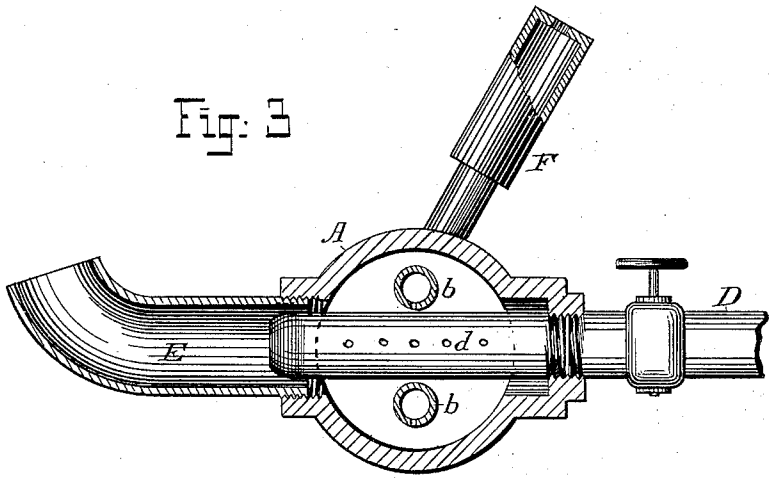


Fig. 4

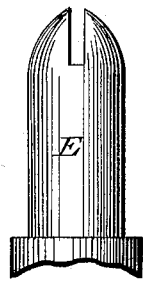


Fig. 5

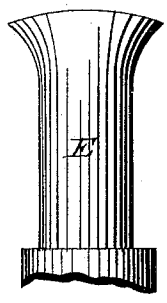
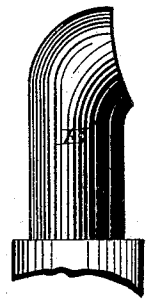


Fig. 6



Witnesses:

L. R. Vorce.

Alb. Walker

Inventor;

John Bragg

by C. M. Vorce

Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

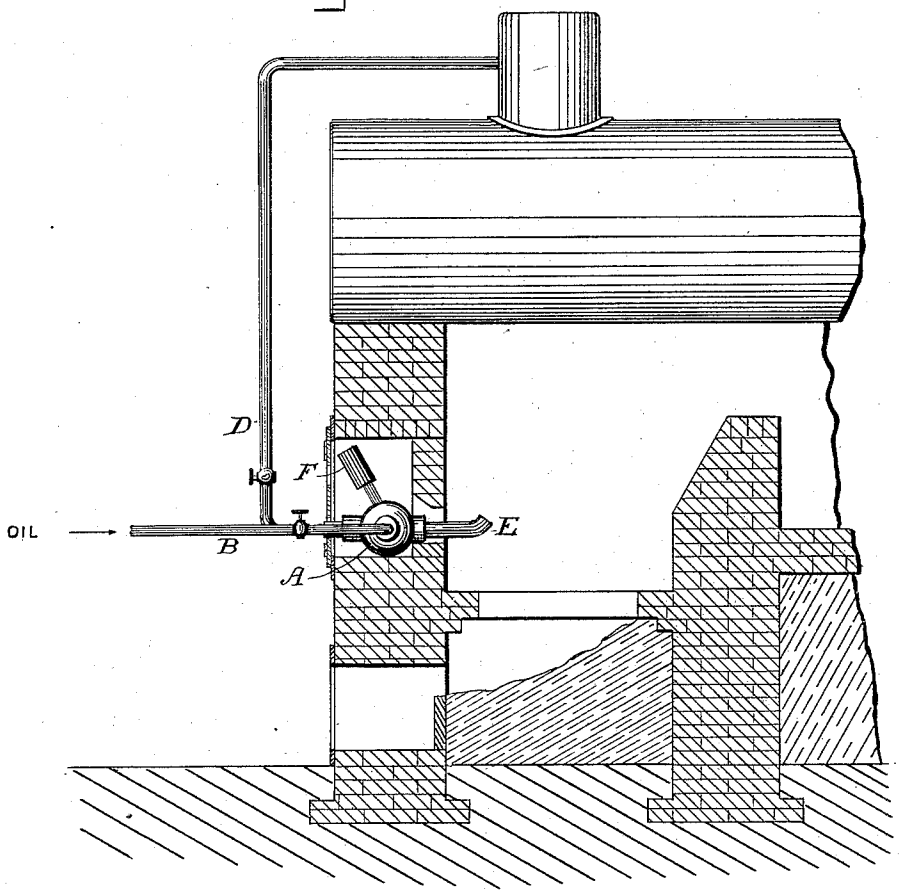
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J. BRAGG.

OIL BURNER.

No. 409,556. Patented Aug. 20, 1889.

Fig. 7



Witnesses:

W. B. Vose,

A. B. Wales

Inventor:

John Bragg

by C. W. Vose

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UNITED STATES PATENT OFFICE.

JOHN BRAGG, OF CLEVELAND, OHIO.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 409,556, dated August 20, 1889.

Application filed March 30, 1889. Serial No. 305,495. (No model.)

To all whom it may concern:

Be it known that I, JOHN BRAGG, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Oil-Burners; and I hereby declare that the following is a full, clear, and exact description of my said invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings.

My invention relates to the class of burners in which crude oil or heavy oil is used as a fuel in distinction from burners designed to burn the lighter hydrocarbons—such as gasoline or kerosene; and it consists in certain novel features of construction and combination of parts hereinafter described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a horizontal sectional view of an oil-burner constructed according to my invention. Fig. 2 is a vertical longitudinal sectional view of the device shown in Fig. 1, taken on the line *x x* of Fig. 1. Fig. 3 is a vertical sectional view taken on the line *y y* of Fig. 1. Figs. 4, 5, and 6 are detached views showing different forms and adjustments of the nozzle. Fig. 7 is a view in elevation of the burner in place under a steam-boiler.

A represents the shell or body of the burner, preferably cast in a single piece, and with an opening in the end of each of its four arms.

B is the oil-supply pipe, with suitable valves at any convenient point, and is threaded into a bushing *c*, which closes one end of the shell. An oil-inlet pipe *b* is threaded into the inner end of the same bushing, and is preferably bent in a return-bend and partially closed at its free end; but it may, if preferred, be straight. The pipe *b* is perforated along its whole length with small holes b^2, for the escape of oil. I prefer to form these perforations in the under side of the pipe; but their location is not essential, as the emitted oil will in any case trickle downward over the pipe. The opposite end of the shell is closed by a plug *c'*, or left solid in the casting. Into one of the cross-arms of the shell is threaded a steam-supply pipe D, provided with the usual valve, and extending within and across the shell is an injector-pipe *d*, forming a continuation of the steam-pipe D, and terminating in a reduced end at or slightly beyond the end of the opposite arm of the shell.

E is a nozzle threaded, either directly or by means of a bushing, into the cross-arm of the shell opposite the injector-pipe, and extending far enough into the shell to receive the end of the injector-pipe. The nozzle E may be straight or curved and widened or contracted at its outlet to suit the work to be done or the situation where it is to be used, and its direction may be varied so as to direct the flame upward, downward, or to either side or directly forward at will without changing the setting of the body of the burner. In Fig. 3 the nozzle is shown directed upward, as in burning brick, &c. In Fig. 6 it is shown turned to one side. In Fig. 5 an expanded outlet suitable for steam-boilers is shown, and in Fig. 4 a jet-nozzle for melting-furnaces. The injector-pipe *d* passes between the bends of the oil-inlet pipe, and is perforated on each side at that point, so as to throw jets of steam into each arm of the shell A and convert into spray the oil trickling from the holes in the inlet-pipe *b*, which mingled spray of steam and oil is carried into the nozzle E by the suction of the injector. At the top of the shell A, and preferably entering at an angle, as shown in Fig. 3, is located one or more air-chambers F, open to the external air and communicating by a small opening with the interior of the shell, through which chambers air is drawn by the action of the injector and mingles with the emitted spray of oil and steam.

In setting the burner the nozzle projects through a wall of brick, leaving the body of the burner outside the furnace. In setting the burner under a boiler it is placed in the door-opening of the fire-box, setting level and within the door, and a wall of brick is laid up in front of the burner to close the door-opening. A small opening or a removable brick is left above the burner to allow of observation of the flame, and also to permit manipulation of the nozzle. The ash-pit is also preferably partially filled up or closed and the grate-bars removed.

In using the burner the character of the flame is regulated by means of the oil and steam valves in the usual way.

What I claim is—

1. In an oil-burner, the combination of the shell having lateral arms and air-inlets, a perforated oil-inlet pipe extending within said shell lengthwise thereof, a nozzle secured to one of said lateral arms of the shell, and a steam-injector pipe entering said shell through the other lateral arm thereof and extending across the shell and into said nozzle, said injector-pipe being perforated opposite the long arms or body of the shell, substantially as described.

2. In an oil-burner, the combination of a shell having lateral arms and having air-inlets at the top of said shell, a perforated oil-inlet pipe extending within said shell lengthwise thereof and bent in a return-bend, a nozzle secured to one lateral arm of the shell and adapted to be turned to change the direction of the flame, and a steam-injector pipe entering the other lateral arm of the shell and passing across the same into said nozzle, being perforated within the shell, substantially as described.

3. The combination of the shell A, having air-inlets F and lateral arms, to one of which is affixed the nozzle, the steam-injector pipe *d*, entering the other lateral arm, perforated within the shell and extending across the same and into the nozzle, and the perforated oil-inlet pipe *b*, bent in a return-bend and extending through the long arms of the shell, and the curved nozzle E, adapted to be turned so as to direct the flame in any desired direction, substantially as described.

Witness my hand at Cleveland, Ohio, this 18th day of March, A. D. 1889.

JOHN BRAGG.

Witnesses:

WM. JOHNS, Jr.,

A. M. WILLIAMS.