

(No Model.)

W. WILLS.
OIL OR GAS BURNER.

No. 466,144.

Patented Dec. 29, 1891.

Fig. 2.

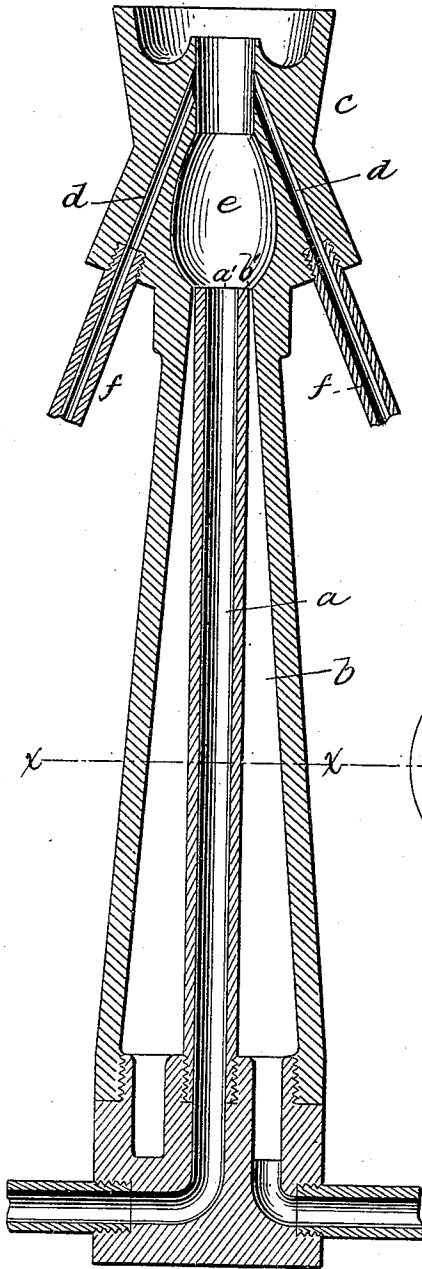


Fig. 3.

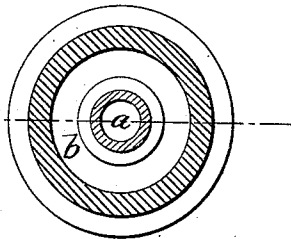
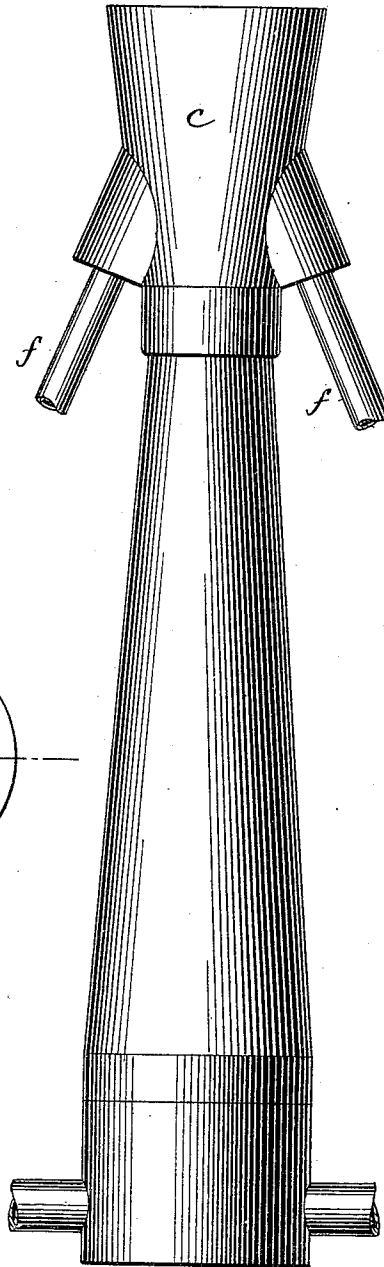


Fig. 1.



WITNESSES,

Raymond Barnes
Wm. A. Reinbauer

INVENTOR.

William Wills.

W. J. Johnston
ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM WILLS, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO ALEXANDER W. BUTTERWORTH, OF NEW YORK, N. Y.

OIL OR GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 466,144, dated December 29, 1891.

Application filed February 19, 1889. Serial No. 300,410. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WILLS, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Oil or Gas Burners, of which the following is a specification.

The invention has reference to oil and gas burners of that particular class in which oil, steam, and air are intermingled at or near the mouth of the burner. This form of burner is usually utilized in furnaces for heating purposes.

The object of the invention is to provide a burner which shall be very cheap of manufacture and at the same time be efficient in operation.

The invention consists of the particular construction of the burner whereby the greatest percentage of the heat products of the materials burned is utilized.

In the accompanying drawings, Figure 1 represents an elevation of the burner; Fig. 2, a longitudinal section of the same, and Fig. 3 a cross-section taken on line *x x*.

The construction of the body of the burner is of any of the usual forms—that is to say, it may embrace a passage *a* for the oil through the center of the burner and a passage *b* around the same for steam. These two passages have their outlets at about the same point—viz., *a'* and *b'*, respectively. These outlets, however, are not at the extreme end of the burner, and it is not usually the case that they are so. There is generally built on or fixed in some manner to the end of the burner a flaring mouth-piece *c*, to serve as a mixing-chamber wherein the oil or gas and steam become mixed before ignition, and also to serve as a means for spreading the flame. Provision has also been made heretofore for a supply of air, which has been introduced at or near the point of introduction of the steam and oil. I have discovered that better results are obtained by thoroughly mixing the oil and steam first and afterward allowing the mixture to mingle with air, the air, however, joining with the combined steam and oil before the point of ignition is reached and inside of the usual flaring nozzle. I accomplish this result by providing the flaring nozzle with two diagonal passages *d d* for the air. These passages com-

municate with the chamber within the flaring mouth at points about one-third the length from the outer end. This leaves a space *e*, wherein the oil and steam may commingle before coming in contact with the air. The flaring mouth is provided with enlargements, as shown, through which the air-passages are formed and in which leading-in pipes *ff* may be screwed. These pipes will ordinarily extend to the rear through the furnace-wall and communicate with the outside atmosphere or with an air-blast apparatus. With a burner of this construction I have found that the quantity of oil burned to equal the heating capacity of a ton of coal is much less than with those burners in which air, steam, and oil come together simultaneously. It will thus be seen that in this construction of burner, besides providing an efficient apparatus, the provision for the admission of air is made at very slight cost. As an article of manufacture the burner will probably be made without the pipes *ff*. They may be inserted at the pleasure of the user.

Having thus described my invention, I claim—

1. An oil-burner consisting of a mouth-piece provided with a mixing-chamber, concentric pipes leading into said chamber and serving as passages for oil and steam, respectively, a channel leading from said mixing-chamber at a point opposite or approximately opposite said pipes, and air-passages extending at an angle through the walls of the mouth-piece and entering said channel at points beyond said mixing-chamber.

2. An oil-burner consisting of a mouth-piece provided with a mixing-chamber, passages for oil and steam leading into said mixing-chamber, a channel leading out of said mixing-chamber at a point opposite or approximately opposite the steam-passage, and a passage for air opening into said channel at a point beyond said mixing-chamber.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM WILLS.

Witnesses:

WM. A. ROSENBAUM,
FRANK C. GRUEN.