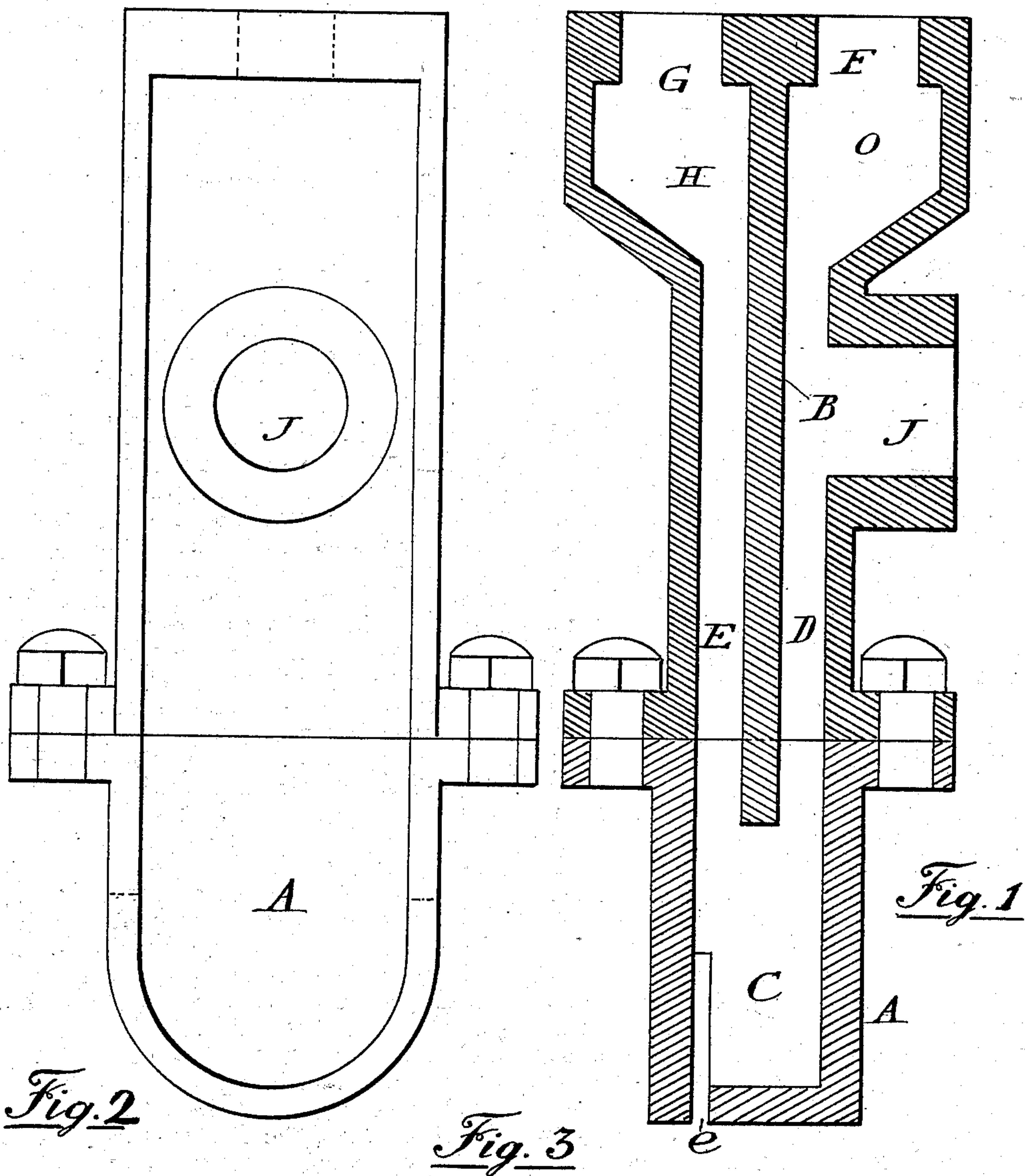


No. 698,361.

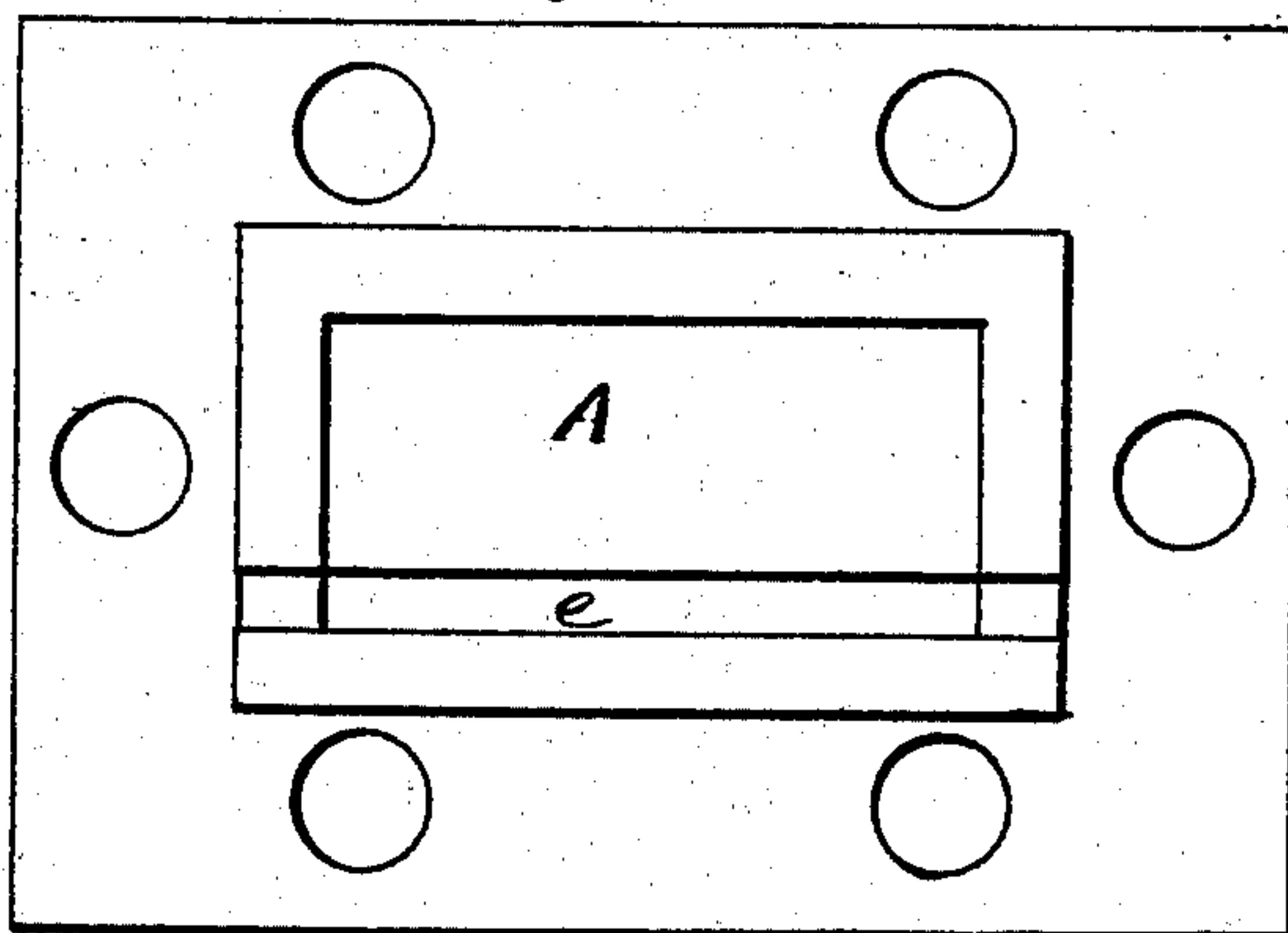
Patented Apr. 22, 1902.

W. BOOTH.  
OIL BURNER FOR FURNACES.  
(Application filed Oct. 14, 1901.)

(No Model.)



WITNESSES:  
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H. H. Grawold



INVENTOR:  
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# UNITED STATES PATENT OFFICE.

WILLIAM BOOTH, OF SAN FRANCISCO, CALIFORNIA.

## OIL-BURNER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 698,361, dated April 22, 1902.

Application filed October 14, 1901. Serial No. 78,651. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BOOTH, a citizen of the United States, residing at and in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Oil-Burners for Furnaces; and I do hereby declare that the following is a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention relates to that class of nozzles for spraying crude oil into furnaces for the purpose of burning the oil as a fuel in which the oil and steam are admitted through separate passages into a flat or rectangular casting and ejected therefrom in the form of spray by the force of the steam. In this class of burners the horizontal slit or opening through which the mingled spray of steam and oil is ejected into the furnace has heretofore been made through the nosepiece in a line with the middle of the chamber, and it extended only across the front end of the nosepiece. My improvement consists in making the bottom of this chamber perfectly flat in a horizontal plane and in placing the slit or opening in line with the horizontal bottom of the floor; also, in extending the slot or opening backward along each side of the nosepiece for a short distance, so that the ejected spray will be thrown out in a fan shape and thus cover a greater area in the furnace; also, in providing an expansion-chamber in the steam-passage before it reaches the point where it comes in contact with the oil, thereby giving a more uniform pressure of steam in the steam-passage and mixing-chamber, all as hereinafter more fully described, referring to the accompanying drawings, in which—

Figure 1 is a side sectional elevation of my oil-burner or nozzle. Fig. 2 is a plan view, and Fig. 3 is a front view, of the nozzle.

The oil-burner represented in the drawings is patterned after the oil-burner shown and described in my former Letters Patent, No. 533,521, dated February 5, 1895; but it will be understood that my improvements can be applied to any of the various forms of nozzles or oil-burners.

The nozzle A, whether round, square, or oval, is cast or constructed with an internal

central partition B, which extends entirely across the nozzle from its rear to near its front end; but it terminates at a short distance back from the front end, so as to form a chamber C. This provides an upper passage D and a lower passage E, leading through the nozzle from its rear end to the chamber in its forward end. The forward end of the nozzle has a narrow slit *e* extending horizontally across its front face and also to a short distance back along its sides. The upper passage D forms the oil-passage, while the lower passage E forms the steam-passage. Oil is admitted into the upper passage D through an opening F, which is connected with a pipe which leads to the oil-supply, and steam is admitted at the rear end of the lower passage through the opening G. The oil flows from the oil-opening along the floor of the oil passage or partition until it enters the chamber C, where it meets the current of steam which comes through the lower passage. The chamber C in front of the partition B forms a mixing-chamber, where the steam and oil are intermingled, and from whence they are ejected through the narrow slit *e* by the steam-pressure in the form of a fan-shaped spray of oil, which when ignited will fill the entire furnace with flame. The slit *e* is placed low down across the front end of the nozzle and in a plane with the floor of the chamber C, so that the entire space of the chamber above the slit will form a confined mixing-chamber, where the steam and oil are intermingled before being ejected as a spray. Just in front of the opening G through which the steam is admitted into the steam-passage I enlarge the passage, so as to form a chamber H, into which the steam enters before it passes into the narrow part of the steam-passage and where it is allowed to expand before coming in contact with the oil, thereby giving a greater uniformity of pressure and a better spray. A chamber O, similar to the chamber H, is also formed in the upper passage more for the sake of giving a uniformity of appearance than for any special or useful purpose. In front of the chamber O is an air-opening J; but this opening can be dispensed with, as ordinarily sufficient air is provided at the nozzle and in the furnace to support combustion of the sprayed oil. I prefer, however, to



use the air-supply, as it lightens the mixture of oil and steam and produces a more active spray.

In the construction of this burner I make  
5 the front end or nosepiece, which is subjected to the greatest heat, in a separate piece and provide flanges *pp*, so that the nosepiece can be bolted onto the nozzle. It can then be removed or renewed when desired.

10 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An oil-burner of the class described for spraying crude oil into furnaces, consisting  
15 of a flat rectangular casting provided with an oil-passage and adjacent steam-passage, separated by a partition; a nosepiece bolted onto the casting in front of the partition, the interior of said nosepiece forming a chamber,  
20 a horizontal floor in said chamber and a slit in the forward end of the nosepiece in line with the floor of the chamber, substantially as described.

2. In an oil-burner of the class described for spraying crude oil into furnaces, a flat  
25 rectangular nosepiece secured to the front end of the burner; a rectangular chamber in said nosepiece, a horizontal slit entirely across the front and extending for a distance  
30 back along each side of the extremity of the nosepiece which projects into the furnace, substantially as described.

3. In an oil-burner for intermingling steam and oil and spraying them into a furnace, a  
35 rectangular chamber in the forward end of the burner or nozzle in front of the partition which separates the oil and steam passages, a horizontal floor in said chamber and a slit-  
40 ted opening in the front end of the nozzle in line with the floor of the chamber, substantially as described.

WILLIAM BOOTH.

Witnesses:

FANNY DALY,  
J. Y. RAMSEY.