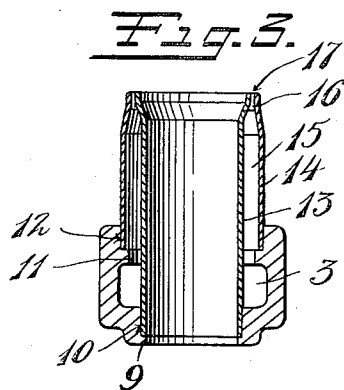
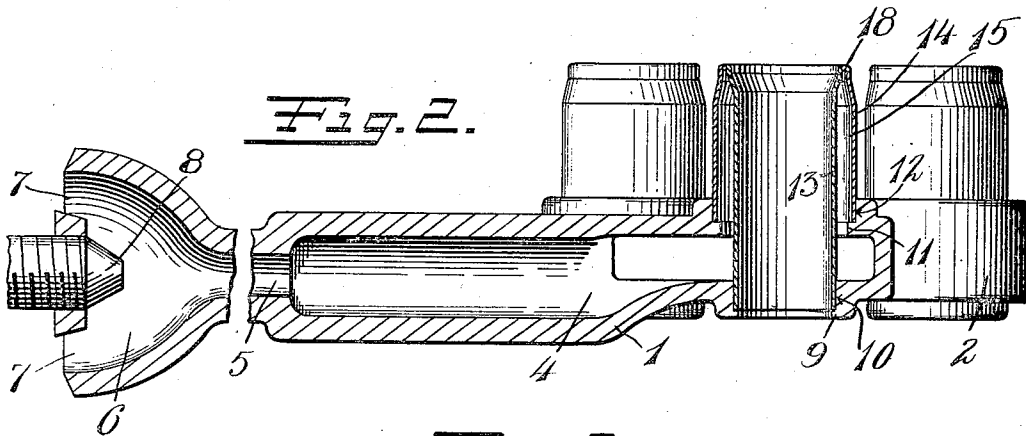
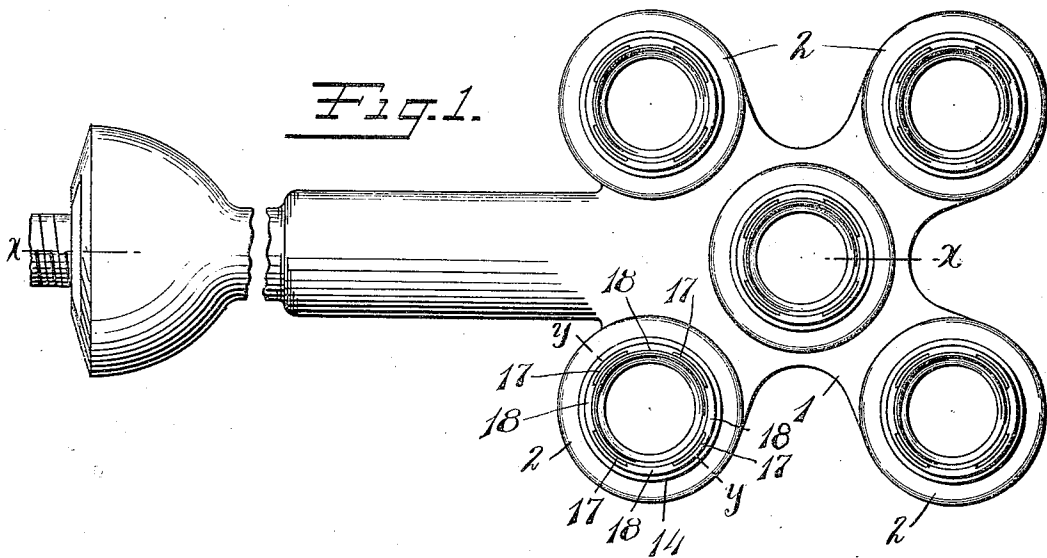


L. E. SHAW,
BURNER.
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991,759.

Patented May 9, 1911.



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS E. SHAW, OF NEW YORK, N. Y., ASSIGNOR TO THE J. B. COLT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

BURNER.

991,759.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS E. SHAW, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Burners, of which the following is a full, clear, and exact description.

My invention relates to heating burners, and has for its object to produce a simple and efficient burner for burning gas, and more particularly acetylene gas, for heating purposes.

It further has for its object to produce a noiseless burner.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawings, in which—

Figure 1 is a full size plan view of a heating burner having five burner heads. Fig. 2 is a vertical section of the same on the line $x-x$, Fig. 1. Fig. 3 is a vertical section of one of the burner heads on the line $y-y$ Fig. 1.

Referring more particularly to the drawings, 1 is a base preferably of cast iron having a plurality of arms 2, each having a passage 3 connected to a main passage 4, to which leads a constricted passage 5, which is connected to the inlet 6 having openings 7 leading to the outer air. Into the chamber 6 protrudes a gas jet or nozzle 8 delivering gas under pressure. The connecting portion containing the passage 5 has been broken away in the drawings so as to reduce the distance between the ends of the passage 5 to about two-fifths of what it is in actual practice.

A burner head is located on the extremity of each of the arms 2 and also at the center of the meeting point of said arms. The top and bottom portions of the base have openings which register with one another and are concentric with the burner heads. Upon the bottom portion of the casting and concentric with each opening therein I form a seat 9, having adjacent thereto a circumferential vertical surface 10. Upon the upper portion of the casting I form corresponding seats 11 and vertical circumferential walls 12. The seats 9 are of less diameter than the seats 11 and the walls 10 are of less diameter than the walls 12. In engagement with each seat 9 and in close contact with its wall 10, so as to make a gas-

tight joint, I mount an inner tube 13, the opening through the same constituting an internal air passage for the burner head. This tube is sufficiently out of contact with the seat 11 so as to afford a free passage for the mixed gas and air from the passage 3. In engagement with the seat 11 and the vertical wall 12 I place an outer tube 14, the engagement being such as to make a gas-tight joint. The outer and inner tubes 13 and 14 are spaced apart throughout the greater part of their length so as to form a relatively large chamber 15, which will offer little friction to the passage of the mixed air and gas therethrough. The upper ends of the tubes 13 and 14 are expanded or contracted so as to leave between them a narrow curved burner slot for the passage of the mixed air and gas to be burned. The chamber 15 between the tubes 13 and 14 is abruptly ended at 16 so as to have most of the resistance to the passage of the mixed air and gas by reason of friction confined to a very short space. The axis of the curve of the slot is the center of the two tubes.

When the burner slot constitutes a continuous circle, and particularly when the burner heads are closely associated, as they oftentimes must be in practice in both extended oven burners and grouped burners, the combustion of the gas supplied to the burner will under many conditions produce a loud singing or whistling noise, which is very objectionable. I have discovered that this can be prevented by dividing the curved burner slot into a number of portions 17, and in my preferred form of construction divide it into four portions 17, by means of four intermediate circumferentially extended blank sections 18, the sections 18 being equal to the length of the portions 17 of the slot. The blank sections I prefer to form by means of circumferentially extended projections carried by the outer tube and engaging the inner tube. When the flame is thus subdivided, the burner ceases to sing or whistle under practically all if not all conditions. Its heating capacity is, moreover, increased since substantially the same amount of mixed air and gas passes through it, the rate being faster for the same injector pressure and the mixture passing through it is burned to better advantage.

When the form of burner shown in Fig. 110

1 is used, the outer tubes are exposed to the air passing between the arms, while the inner tubes are exposed to the air passing through the openings therein with a result that air is freely supplied to the gas as it issues from the slots in order to produce perfect combustion. The slot is preferably about 2/100ths of an inch in width, and the width of the chamber 15 is about one-eighth of an inch.

The projections 18 upon the tube 14 not only serve to divide the slot into portions 17, but also by bearing against the inner tube 13 act the same as narrow projections in maintaining it properly centered relatively to the outer tube.

The burner is operated in the same manner as other injector burners. Gas under pressure is supplied to the injector tip 8, and, drawing in air through the ports 7, mixes therewith and passes through the passage 5 to the passage 4 and thence to the chambers 15 between the tubes 13 and 14 and through the slots 17 between the upper ends of the tubes. The slot in each tube being divided up into a number of portions 17 by the projections 18, results in a corresponding number of distinct flames, the divisions of which result in the noiseless operation of the burner. The gas mixture, although under a low pressure, burns freely at the burner slots, since it is but little retarded by going through the passage 4 and the distended chamber 15.

The invention permits of various modifications in its embodiment, as will be evident to those skilled in the art. While I prefer to have the slots divided into four parts by four dividing projections equal to the several parts, I do not desire to confine myself to that number of parts or the relations between the parts and the projections, since these numbers and proportions are not essential.

What I claim is:

1. A burner head consisting of an outer tubular member and an inner tubular member, said members being of substantially circular contour and spaced apart to form a chamber, one of said members extending toward the other abruptly at its upper end whereby the chamber is abruptly ended, one of said members having at its upper end a plurality of separated circumferentially extended projections engaging the other member, forming circumferentially extended closures between said members and leaving a series of intermediate slots, said slots being narrow relatively to said chamber and constituting short passages substantially in the form of arcs of a circle and communicating with said chamber, and means for supplying mixed air and gas to said chamber.

2. A burner having a plurality of adjacent radiating arms, a burner head at the end of each arm, each head consisting of an outer tubular member and an inner tubular member, said members being of substantially circular contour and spaced apart to form a chamber, one of said members extending toward the other abruptly at its upper end whereby the chamber is abruptly ended, one of said members having at its upper end a plurality of separated circumferentially extended projections engaging the other member, forming circumferentially extended closures between said members and leaving a series of intermediate slots, said slots being narrow relatively to said chamber and constituting short passages substantially in the form of arcs of a circle and communicating with said chamber, and means for supplying mixed air and gas to said chamber.

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