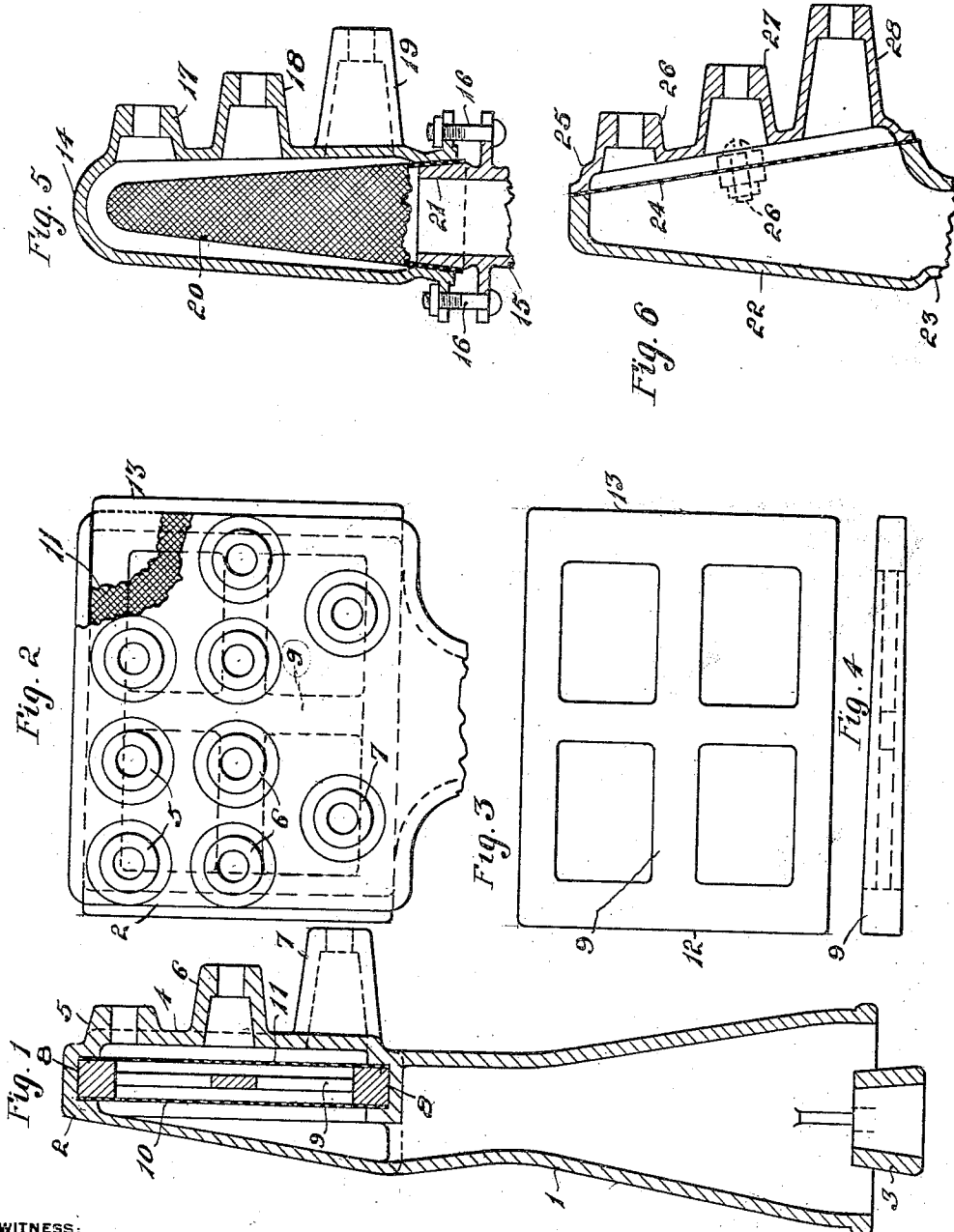


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BURNER.

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WITNESS:

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES A. BACKSTROM, a citizen of the United States, residing at Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Burners, of which the following is a specification.

The invention relates to gas burners. It has for its primary objects the provision of an improved form of burner, (1) wherein the construction is simplified and cheapened, (2) wherein the danger of back-firing is reduced and the burner gauze properly protected, (3) wherein the body of mixed air and gas is projected and subdivided in such manner that the combustion is rendered more perfect, (4) wherein the flame development takes place in a horizontal plane, and before contacting with the water coils of the heater, (5) wherein the gauze and the interior of the burner is protected from water of condensation, (6) and wherein the use of threaded members for maintaining the parts in assembled position, and the consequent trouble due to the parts corroding and rusting into fixed position, is avoided. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical section through a burner embodying my invention; Fig. 2 is a front elevation of the head of the burner with the corner thereof broken away to show the interior construction; Figs. 3 and 4 are face and edge views respectively, of the clamping plate employed for holding the gauze; and Figs. 5 and 6 are vertical sectional views through the heads of modified types of burners.

Referring to the construction of Figs. 1 to 4, the reference numeral 1 designates the Bunsen tube carrying at its upper end the burner head 2 and at its lower end the supporting ring 3 integral with the Bunsen tube and adapted to fit the supply spud in the usual way. The discharge face 4 of the head is provided with a plurality of outlet spouts 5, 6 and 7 extending substantially horizontally and arranged in horizontal rows, as indicated in Fig. 2.

The spouts are tapered internally and decrease in length from the bottom up, as indicated in Fig. 1, so that the flames are separated as widely as possible, giving access of the secondary air thereto and an improved combustion. The horizontal posi-

tion of the spouts serves to prevent access to the interior of the burner of the water of condensation which drips from the coils of the heater. The spouts also direct the flames horizontally giving a complete combustion below the water coils of the heater and before the flames contact with the water coils.

The ends of the burner head are open and guideways 8—8 are provided in the interior of the head in alinement with such openings for receiving the skeleton clamping key 9 shown in Figs. 3 and 4. This key serves to clamp the gauzes 10 and 11 in place and is preferably made tapered as indicated in Fig. 4, to permit its being readily driven out to release the gauzes when it is desired to replace, clean, or renew them. When the key 9 is driven into final position in the head, its end edges 12 and 13 (Fig. 3) project past the end edges of the burner head (see Fig. 2). The ends of the key thus close the openings in the ends of the burner head and are accessible for hammering the key into and out of position.

When the clamping key 9 is driven into position it is securely held in such position by friction, and yet may be easily driven out when it is desired to remove the gauzes, this arrangement doing away with the necessity of bolts, such as are usually employed in connection with burner heads and which ordinarily rust tightly in position rendering the disassembling of the parts difficult. The entire burner with the exception of the clamping key and gauzes is cast in one piece and is of very durable construction, since the spouts serve to prevent back-firing to the gauzes 10 and 11 and such gauzes are thoroughly protected from the water of condensation dripping from the coils above. The use of the two gauzes is also advantageous since additional protection is thus afforded against back-firing.

Fig. 5 illustrates a modified construction in which the head 14 is separate from the tube 15 and is clamped in position by means of the bolts 16. The spouts 17, 18 and 19 correspond to those in the construction of Figs. 1 and 2, but the gauze 20 is of tent form with its lower circular edge clamped between the tapering upper end 21 of the tube and the tapering lower end of the burner head.

Fig. 6 illustrates another modification in which the head 22 is integral with the burner tube 23 but has an open face across which extends the gauze 24 clamped in posi-

tion by the discharge plate 25, bolts 26 at the ends of the head serving to secure the plate to the head. The discharge plate 25 is provided with spouts 26, 27 and 28 corresponding to those of the other types of construction. The term "gauze" as used throughout is intended to designate broadly a foraminous screening plate whether made of woven wire or by punching small holes in a metal sheet, both types of gauzes being well known in the art.

What I claim is:

1. The combination with a Bunsen tube, of a head into which the tube opens, an upright gauze in the head through which the gas flows, a chamber at the front of the gauze, and a plate at the front of the chamber provided with a plurality of substantially horizontal discharge spouts distributed over the plate and lying opposite the side face of the gauze.

2. The combination with a Bunsen tube, of a head into which the tube opens, an upright gauze in the head through which the gas flows, and a plate at the front of the gauze provided with a plurality of substantially horizontal discharge spouts distributed over the plate and lying opposite the side face of the gauze.

3. The combination with a Bunsen tube, of a head into which the tube opens, a gauze in the head through which the gas flows, and a plate at the front of the gauze provided with a plurality of substantially horizontal discharge spouts of varying lengths, in series one above the other, with the length decreasing from the bottom of the plate up.

4. The combination with a Bunsen tube, of a head into which the tube opens, a gauze in the head through which the gas flows, and a plate at the front of the gauze provided with a plurality of horizontal rows of substantially horizontal discharge spouts, the spouts of the upper row being shorter than those in the row therebeneath.

5. The combination with a Bunsen tube, of a head into which the tube opens, a gauze in the head through which the gas flows, and a plate at the front of the gauze provided with a plurality of horizontal rows of substantially horizontal discharge spouts, the spouts of each of the rows above the bottom row being shorter than the spouts of the row next beneath.

6. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and another opening through the end of the head, a removable clamping member fitting said last opening, and a gauze back of the discharge face of the head gripped between the clamping member and the head.

7. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and another opening through the end of the head, a guideway in the head in alinement with such last opening, a gauze lying in the guideway opposite the discharge face of the head, and a clamping key fitting the guideway behind the gauze and removable through said last opening.

8. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and another opening through the end of the head, a guideway in the head in alinement with such last opening, a gauze lying in the guideway opposite the discharge face of the head, and a skeleton clamping key fitting the guideway behind the gauze and removable through said last opening.

9. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and another opening through the end of the head, a guideway in the head in alinement with such last opening, a pair of gauzes lying in the guideway opposite the discharge face of the head, and a skeleton clamping key in the guideway between the two gauzes and removable through said last opening.

10. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and another opening through the end of the head, a guideway in the head in alinement with such last opening, a gauze lying in the guideway opposite the discharge face of the head, and a tapering clamping key fitting the guideway behind the gauze and removable through said last opening.

11. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and other openings through the ends of the head, a guideway between said last openings, a gauze lying in the guideway opposite the discharge face of the head, and a skeleton clamping key fitting the guideway behind the gauze and having its ends closing said last openings.

12. The combination with a Bunsen tube, of a head integral therewith and having a discharge opening through the face thereof and other openings through the ends of the head, a guideway between said last openings, a gauze lying in the guideway opposite the discharge face of the head, and a skeleton clamping key fitting the guideway behind the gauze and having its ends closing said last openings, the said key being tapered and held frictionally in place.

CHARLES A. BACKSTROM.