Feb. 23, 1943. H. C. REINHART 2,311,778

GAS BURNER

Filed April 19, 1940 2 Sheets-Sheet 1

Fig. 1

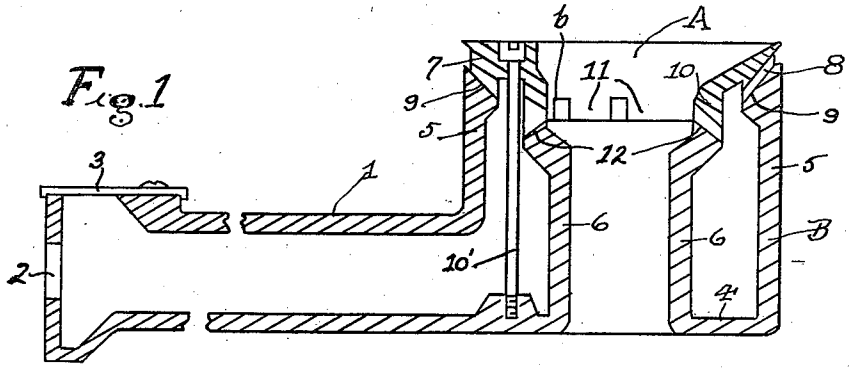


Fig. 2

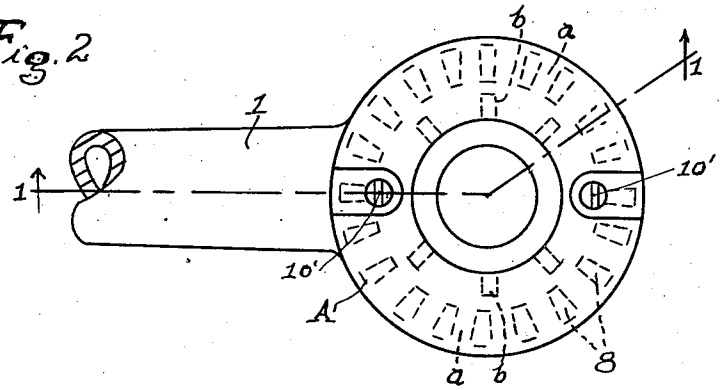
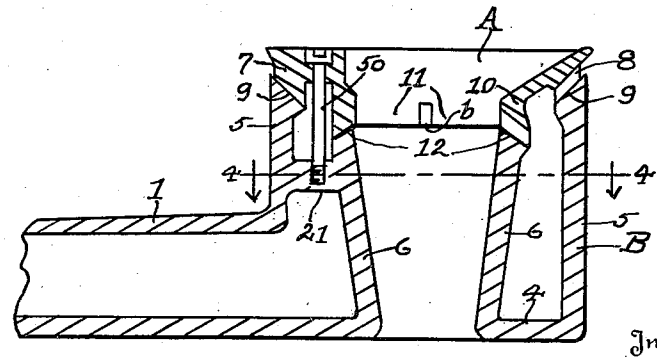


Fig. 3



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Feb. 23, 1943. H. C. REINHART 2,311,778

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Filed April 19, 1940 2 Sheets-Sheet 2

Fig. 4

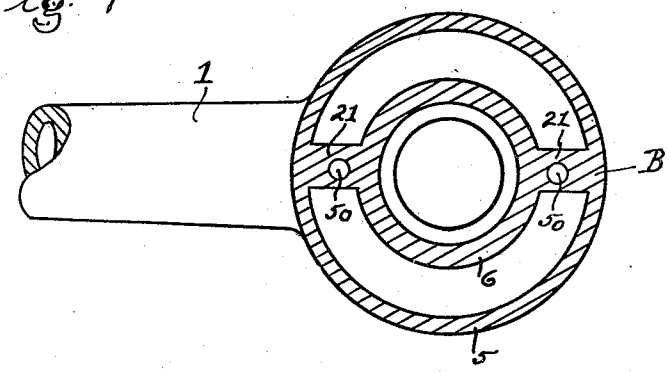


Fig. 5

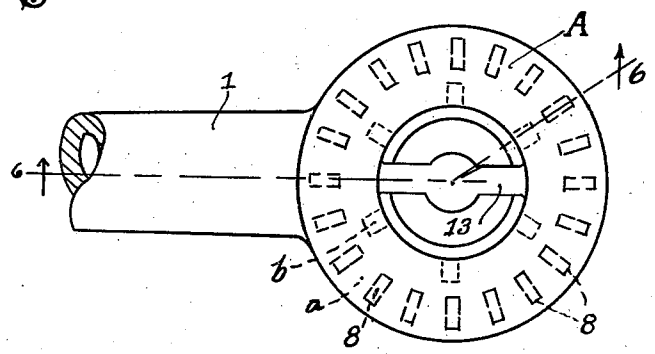
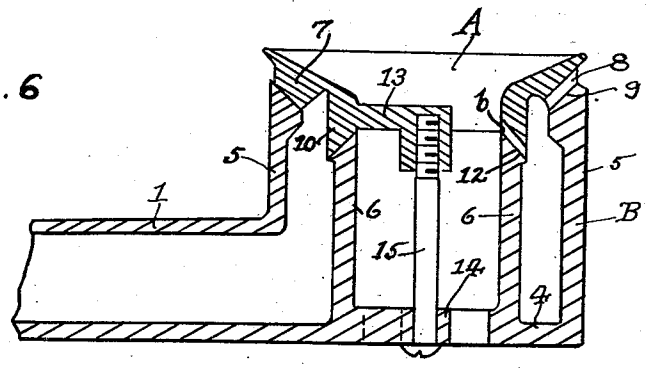


Fig. 6



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UNITED STATES PATENT OFFICE

2,311,778

GAS BURNER

Harold C. Reinhart, St. Louis, Mo., assignor to American Stove Company, St. Louis, Mo., a corporation of New Jersey

Application April 19, 1940, Serial No. 330,608

3 Claims. (Cl. 158—116)

This invention relates to improvements in gas burners which consists of a body portion having upwardly extending concentric walls and a cap having depending concentric walls, said walls so arranged and so constructed that their ends abut and form outer and inner gas ports.

The main object is to so construct the burner that the cap and its depending concentric walls are composed of metal capable of being die-cast, while the body part and its upwardly extending walls are composed of a metal which is capable of being machined for the purpose hereinafter explained.

Another object of the invention is to have the abutting parts of the inner walls of the structure form inner gas ports, and the abutting parts of the outer walls form outer gas ports.

Another object is that of providing a highly efficient burner which can be cheaply manufactured.

The burner cap of the present invention is composed of a metal capable of being die-cast, such as aluminum or any alloy of aluminum. Such metals have a melting point below that of burning gas. These facts are referred to in U. S. Patent No. 1,714,409, dated May 21, 1929.

The said patent was assigned to the American Stove Company of St. Louis, Missouri, and this application is likewise assigned to them. The construction shown in said patent has been manufactured in large quantities by them and sold by the said company. This invention is an improvement on said patent.

In the above patent the inner gas ports are wholly formed in the inner member of the burner, and they are not subjected to the cooling effect at the gas ports that the outer ports of the patented burner have. This invention is to overcome this and other defects. Again in said patent the forming of the gas ports in the inner part of the burner as shown, does not lend itself so readily to the die-cast method, and again said burner adds to the cost of construction by requiring that the whole inner tube be constructed of the more costly alloy.

Hence the further object of the present burner is to overcome the defects mentioned in the immediately preceding paragraph, as well as others which will be hereinafter pointed out.

Further objects of the improvement will appear from an understanding of the following description.

Referring now to the drawings in which

Figure 1 is a vertical sectional view taken on line 1—1 of Figure 2.

Figure 2 is a plan view of Figure 1.

Figure 3 is a vertical sectional view of a burner showing a modified form of clamping the cap and bottom portions together.

Figure 4 is a horizontal view taken on line 4—4 of Figure 3.

Figure 5 is a top plan view of the burner shown in Figure 6.

Figure 6 is a vertical section taken on line 6—6 of Figure 5.

This improvement comprises a cap or top A and a body or bottom or main portion B. Projecting from and having communication with the body B is the usual mixing tube 1 through which the air and gas are drawn. As usual the gas flows through the outer end which is provided with the usual air controlling shutter 3. The operation of said tube 1 is well understood by those skilled in the art and any further description of it is deemed unnecessary.

The body portion B consists of a bottom 4 having an upwardly extending outer wall 5, and an inner concentric wall 6.

Referring now to the cap A, it has a downwardly and inwardly extending wall 7, that is provided at the under side of its outer end with a plurality of radially extending teeth 8 which are located directly above and engage the smooth upper end 9 of the wall 5. Located at the inner end of wall 7 is a short wall 10 that is concentric with said wall 7. The lower end of the short wall 10 is provided with a plurality of radially extending teeth 11 that are located directly above and engage the smooth surface 12 at the upper end of the inner body wall 6, which is concentric with said outer body wall 5.

It will be understood from the foregoing description that the body B of the burner has upwardly extending concentric walls 5 and 6 and that the upper ends of each wall has a smooth surface, and that the cap A has depending walls 7 and 10, and each of the cap walls are concentrically arranged and that the lower ends of said cap walls are each provided with radially arranged teeth 8 and 11 which engage the upper smooth ends 9 and 12 of the concentric body walls 5 and 6. The outer ports *a* are between the teeth 8, while the inner lower ports *b* are between the teeth 11.

In Figures 1 and 2 the body portion and the cap are connected by two screws 10' which pass through the top of the cap A, and the lower ends are screwed into the bottom 4.

Figures 3 and 4 show the body B provided with small shelves 21 positioned in a plane above said mixing tube 1, and screws 50 pass through the cap A and screw into said shelves, and serve to hold the cap and the body together.

In Figures 5 and 6 the cap A is provided with a narrow member 13 which extends from and across the center opening of said cap between the upper and lower gas ports, and another narrow member 14 is located at the lower end of the inner body wall. Said cap and body portion are

connected by an upwardly extending screw 15 which serves to connect said members and to hold the cap and body together.

In order to obtain the best results in gas burner construction, requires that there must be a proper amount of gas and air, i. e., perfect combustion requires about fifteen percent of gas to eighty-five percent of air. When a burner is constructed of two different metals, and when as here one of the metals—aluminum alloy—has a melting point below that of the gas flame produced, additional problems are presented.

Again the cost of producing said structure must be taken care of, that is to say, the two-part structure must be gas-tight at the joint between them and the structure must not be expensive to produce; the whole of the alloy part of the structure must be kept at a temperature below that of a gas flame; the joint between said different structures must not leak gas, and the gas consumption must be the lowest, while the heat produced by the burner must be the highest practicable.

Applicant finds in practice that the above requirements are met by the structure herein shown and described.

The body B is made of cast iron and can be cheaply produced. The upper ends 9 and 12 of the body outer and inner walls 5 and 6 are machined to make a gas-tight fit with the cap teeth 8 and 11. The cap is extremely cheap to make because it is die-cast, as has been stated.

In operation the burner cap is kept cool and prevented from melting for several reasons. The gas-air mixture which passes through the burner ports *a* and *b* has a cooling action. The intimate contact of the cap teeth with the ends 9 and 12 of the cast iron main burner body permits heat in the cap to dissipate into the heavy body. Secondary air flows upwardly through the center opening in the body B and cap A and tends to cool both the body and cap. The large area and volume of the body assure that it will absorb a great amount of heat from the cap.

Although the cast iron body B will melt at a temperature below the maximum temperature which can be attained by the gas flames burned this body will not melt under any conceivable condition that could exist during its use in service.

Although the faces 9 and 12 are illustrated as being inclined or beveled they could be horizontally or otherwise disposed without departing from the inventive concept.

I claim:

1. In a gas burner, a fuel mixture receiving chamber having an open upper end and a cap closure therefor, said chamber having inner and outer concentrically arranged substantially vertically disposed walls, the upper end of the inner wall being beveled to extend upwardly and inwardly and the upper end of the outer wall lying in a plane above the upper end of the inner wall and being beveled to extend upwardly and outwardly, the under side of said cap being provided with a pair of concentrically arranged walls the lower ends of which are beveled to match and seat upon the upper ends of said chamber walls, the lower ends of said cap walls being cut out to form a series of teeth throughout the circumference of said walls to provide inner and outer oppositely directed burner ports at the upper ends of said chamber walls, said cap being composed of a material having a melting point below that of burning gas, and means passing through said burner cap into said chamber and being connected to an interior portion thereof for clamping said cap walls in tight contact with the beveled upper ends of said chamber walls.

2. In a gas burner, a fuel mixture receiving chamber having an open upper end and a cap closure therefor, said chamber having inner and outer concentrically arranged substantially vertically disposed walls, the upper end of the inner wall being beveled to extend upwardly and inwardly and the upper end of the outer wall lying in a plane above the upper end of the inner wall and being beveled to extend upwardly and outwardly, the under side of said cap being provided with a pair of concentrically arranged walls the lower ends of which are beveled to match and seat upon the upper ends of said chamber walls, the lower ends of said cap walls being cut out to form a series of teeth throughout the circumference of said walls to provide inner and outer oppositely directed burner ports at the upper ends of said chamber walls, said cap being composed of a material having a melting point below that of burning gas, interiorly threaded sockets in the bottom of said chamber, and bolts passing through said burner cap and having threaded connection with said sockets for clamping the walls of said cap in tight contact with the upper beveled ends of said chamber walls.

3. In a gas burner, a fuel mixture receiving chamber having an open upper end and a cap closure therefor, said chamber having inner and outer concentrically arranged substantially vertically disposed walls, the upper end of the inner wall being beveled to extend upwardly and inwardly and the upper end of the outer wall lying in a plane above the upper end of the inner wall and being beveled to extend upwardly and outwardly, the under side of said cap being provided with a pair of concentrically arranged walls the lower ends of which are beveled to match and seat upon the upper ends of said chamber walls, the lower ends of said cap walls being cut out to form a series of teeth throughout the circumference of said walls to provide inner and outer oppositely directed burner ports at the upper ends of said chamber walls, said cap being composed of a material having a melting point below that of burning gas, shelves provided with threaded openings extending across said chamber and interconnecting the inner and outer walls thereof, and threaded bolts extending through said burner cap and having threaded engagement with said web openings for clamping said cap walls in tight contact with the upper beveled ends of said chamber walls.

HAROLD C. REINHART.