

March 14, 1933.

F. J. COX

1,901,086

GAS BURNER

Filed June 13, 1932

2 Sheets-Sheet

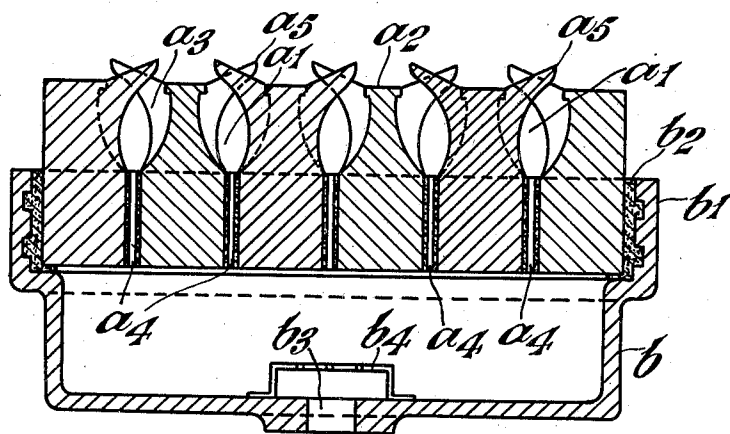


Fig. 1.

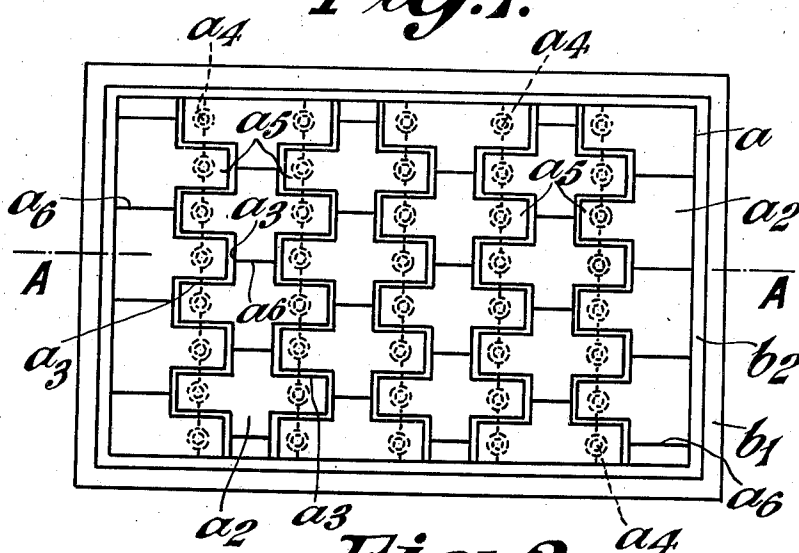


Fig. 2.

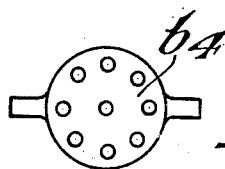


Fig. 3.

Inventor
Frederick John Cox
by
J. P. Wooster
attorney

March 14, 1933.

F. J. COX

1,901,086

GAS BURNER

Filed June 13, 1932

2 Sheets-Sheet 2

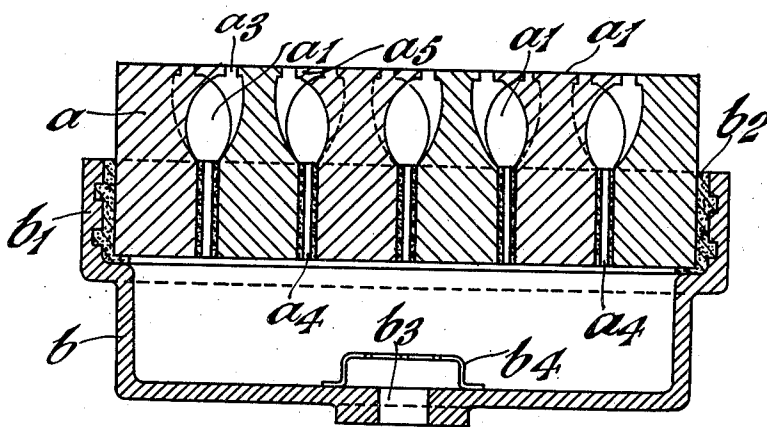


Fig. 4.

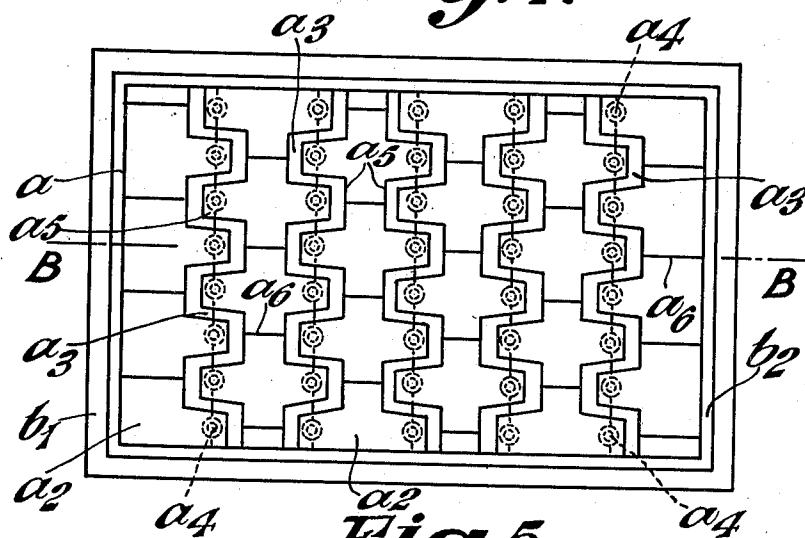


Fig. 5.

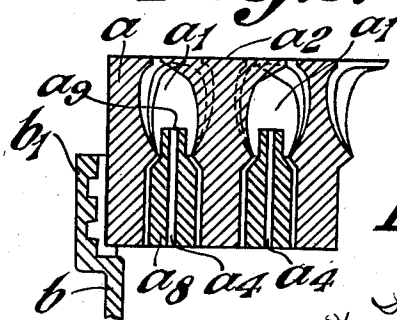


Fig. 6.

Inventor
Frederick John Cox
by
J. S. Hooster
attorney

UNITED STATES PATENT OFFICE

FREDERICK JOHN COX, OF TUFNELL PARK, LONDON, ENGLAND

GAS BURNER

Application filed June 13, 1932, Serial No. 616,849, and in Great Britain May 28, 1931.

Application has been filed in Great Britain, May 28, 1931.

This invention relates to gas burning devices for heating purposes, such devices using burners having an incandescent or hot burner surface of some thickness.

The present invention consists of a gas burner comprising a burner surface element constructed of a material in which are formed one or more longitudinal combustion chambers arranged below a slot extending to the outer surface of the element, wherein each side of the slot is in the form of a series of undulations forming projections extending from opposite sides of the upper surface of the combustion chamber so as to be immediately over combustible mixture holes extending from a mixing chamber into the base of the combustion chamber. The material of the burner surface is preferably a refractory material.

The burner surface element is preferably formed of a number of separate longitudinal combustion chambers arranged parallel to each other below the outer surface of the element and extending the full width thereof, each combustion chamber having in its base a series of holes extending to the mixing chamber. Each combustion chamber is preferably arranged parallel to the outer surface of the burner and to each other and with the slot arranged to convey the combustion products to the surface of the burner.

The undulating character of the slots ensures that there will be no straight channels or combustion outlets in the heating surface of the burner.

The whole of the refractory portion may be built up of strips or portions connected together by any suitable cement or material such as a heat insulating material, the complete burner surface element being held in a suitable casing forming a chamber behind the surface element adapted to be connected to the supply of combustible mixture or supplies of the different ingredients for forming a combustible mixture.

If desirable the refractory surface with its slits or combustion products passages may be separate from the combustion chambers or the

surface may be formed by separate elements connected to the walls of the combustion chambers.

A manner of carrying out the invention is illustrated by the accompanying drawings, wherein Figure 1 is a sectional elevation of one form of the burner on line A—A of Figure 2, Figure 2 a plan of the same, Figure 3 is a detail of a cover for the inlet of the combustible mixture, Figure 4 a sectional elevation of a modification of the burner shown in Figure 1, and is taken on line B—B of Figure 5, and Figure 5 is a plan of the said modification, and Figure 6 is a sectional elevation showing a nozzle modification of Figure 4.

In these drawings *a* is the refractory material of the burner surface element, *b* a container in the upper portion of which is supported the burner surface element *a* and of which the lower portion forms a mixing chamber for the combustible constituents.

In the burner surface element *a* are formed combustion chambers *a1*, *a1*, arranged parallel to each other and to the outer surface *a2* of the refractory material *a*.

Extending from the combustion chambers *a1*, *a1* to the outer surface *a* are narrow slits or passages *a3*, *a3* for the escape of the products of combustion. In Figures 2 and 5 the passages *a3* are shown undulating and extending across the surface *a2* and with the corners of the undulations angular. In Figure 2 the corners of the undulations are right angles whereas in Figure 5 they are slightly larger than right angles so as to give the undulations inclined sides. The passages *a3*, *a3* are formed between adjacent undulating portions of the material of the burner surface *a2*, and such adjacent portions extend in opposite directions from the upper portions of the sides of the combustion chambers *a1* so as to form upper or roof portions. In Figure 1 the ends *a5* of the projecting portions extend above the surface *a2*, while in Figure 4 they are flush with the surface *a2*.

Each of the projecting portions *a5* of the undulations is arranged immediately over an opening or hole *a4* which forms one of a series of holes extending from the bases of the

combustion chambers *a1*, *a1* to the under surface of the refractory material *a*. By this arrangement the flames from these holes *a4* in the combustion chamber will impinge directly on the projections forming the upper laterally undulating portions of the combustion chamber.

In order to provide for expansion and prevent cracking of the refractory material *a*, cuts *a6* are provided as indicated. These cuts may be made by a saw or cutting tool, or by inserting strips of metal or other suitable material in the mould during the process of manufacturing the refractory burner surface. The upper portion *b1* of the container *b* is widened to form a ledge on which the refractory material *a* rests and against which it is held by cement *b2*.

In the base of the container *b* is provided an opening *b3* forming an inlet to the burner for the combustible mixture. This opening *b3* is covered on its inner side with a perforated baffle *b4*. If preferred the baffle can be made without perforations.

By means of a burner having a refractory surface element *a* made in accordance with the present invention, the combustible constituents are ignited in the combustion passages *a1* and so rapidly raise the superimposed refractory material of the burner face *a2* to a high temperature, while the inner surface or layer below the combustion passage *a1* is at a comparatively low temperature and can be made of any suitable material differing from that of the outer layer and preferably a heat insulating material. The invention comprises what may be considered a modified surface combustion apparatus in which the combustion is effected in a restricted space immediately below the surface.

In Figure 6 are shown strip members *a8* containing the holes *a4* conveying the combustible mixture to the combustion chambers or passages *a1*, *a1* each member *a8* being provided with a reduced upper portion *a9* extending into the said combustion chamber *a1*. If preferred the strips *a8* may be made without the reduced upper portion *a9*.

When the combustion element *a* is built up of a number of strips of refractory material cemented together or to an intermediate member containing combustible mixture passages *a4*, each strip is formed with a portion of a combustion chamber, coincident with that of the adjacent strip.

What I claim and desire to secure by Letters Patent is:—

1. A gas burner comprising a burner surface element having a combustion chamber arranged below its outer surface, and means for supplying combustible gas to the combustion chamber, the surface element having a slot extending from the combustion chamber to the outer surface of the element, each side of the slot being in the form of a series of

undulations forming projections extending from the opposite side of the slot over the combustion chamber and over said means.

2. A gas burner comprising a burner surface element having a plurality of combustion chambers arranged below its outer surface, a mixing chamber supporting said element, a plurality of holes in the inner portion of said element connecting said combustion chambers and said mixing chamber, the surface element having a plurality of slots each extending from one of the combustion chambers to the outer surface of said element, each side of each slot being in the form of a series of undulations forming projections extending from opposite sides of the slot over the combustion chamber and over one of said holes.

3. A gas burner comprising a burner surface element constructed of a number of component strips of refractory material cemented together in which is formed a longitudinal combustion chamber arranged below the outer surface of the surface element, an open casing for supporting at its opening the surface element and forming a gas mixing chamber thereunder, an inlet to the mixing chamber for combustible gases, a series of holes in the inner portion of the burner surface element extending from the mixing chamber to the lower surface of the combustion chamber and formed in the divisions between the component strips, the surface element having a slot extending from the upper portion of the combustion chamber to the outer surface of the surface element of which the sides form portions of the sides of the component strips, each side of the slot being in the form of a series of undulations forming projections extending from opposite sides of the slot over the combustion chamber, the projections on one side of the slot extending into the recess on the opposite side thereof and each over one of the holes extending into the mixing chamber from the opposite side of the combustion chamber.

In witness whereof I affix my signature.
FREDERICK JOHN COX.