J. HICKS.

COMBUSTION CHAMBER.

APPLICATION FILED MAR. 14, 1921.

1,414,360. Patented May 2, 1922.

Fig. 1.

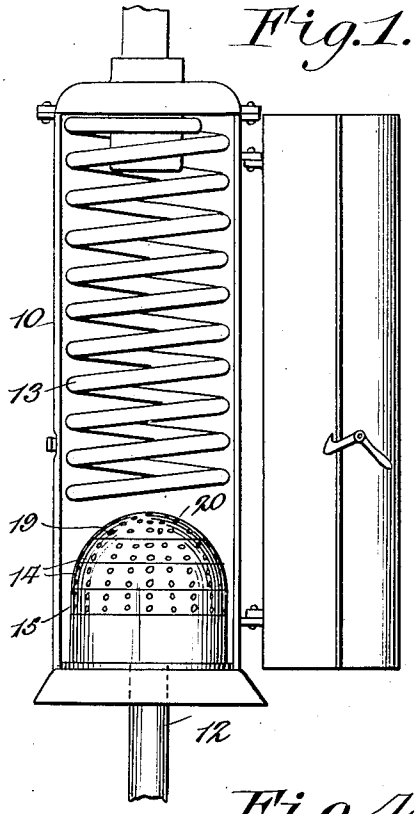


Fig. 2.

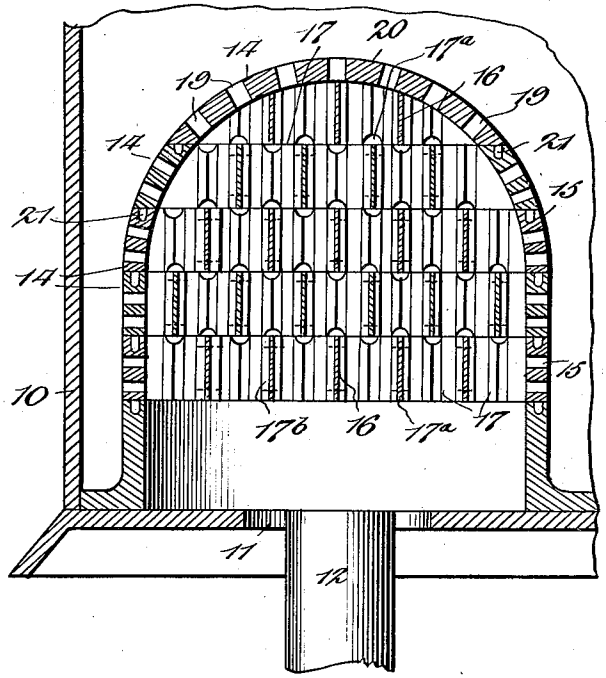


Fig. 4.

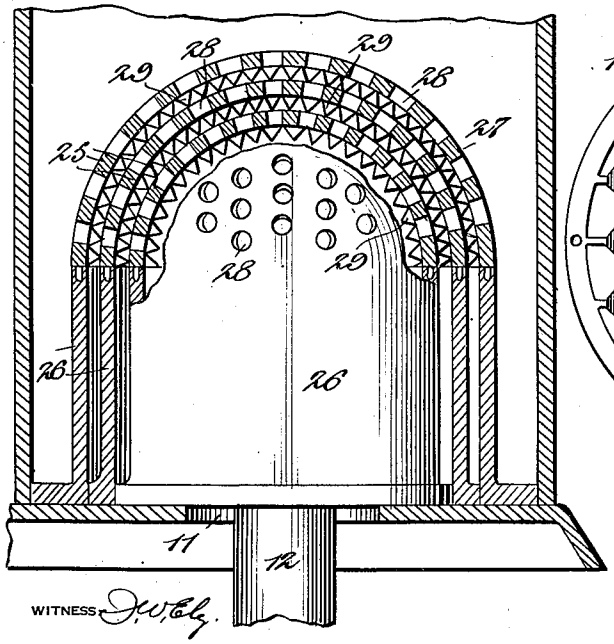
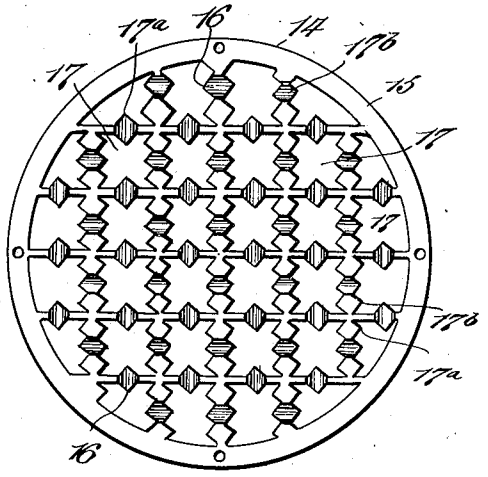


Fig. 3.



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JOHN HICKS, OF SOMERVILLE, NEW JERSEY.

COMBUSTION CHAMBER.

1,414,360. Specification of Letters Patent. Patented May 2, 1922.

Application filed March 14, 1921. Serial No. 452,209.

To all whom it may concern:

Be it known that I, JOHN HICKS, a citizen of the United States, residing at Somerville, in the county of Somerset and State of New Jersey, have invented new and useful Improvements in Combustion Chambers, of which the following is a specification.

This invention relates to improvements in combustion chambers, and the principal object is to provide a device of this nature which will effect complete combustion of the gas.

Another object is to provide means which will absorb all of the heat resulting from such combination and then redeliver the heat to a water coil or other object to be heated.

Another object is to produce a device of this nature which may be built up of several sections provided with means for holding them to each other and for maintaining their baffling portions in spaced relation.

Another object is to produce a device of this nature which shall be simple of construction, cheap to manufacture, and highly efficient for the purpose for which it is designed.

With these and other objects in view which will be more apparent as the specification proceeds, the invention consists of certain novel construction and arrangement and combination of parts, the essential features of which are hereinafter fully described, are particularly pointed out in the appended claims and are shown in the accompanying drawing, in which:—

Figure 1 is a vertical sectional view of my invention as applied to a water heater and showing the preferred form of construction for use with illuminating or low pressure gas.

Figure 2 is a vertical sectional view of the burner and surrounding parts.

Figure 3 is a top plan view of one of the sections of the combustion chamber.

Figure 4 is a vertical sectional view of the combustion chamber as constructed for use with natural gas.

Like characters of reference refer to like parts in all views.

Referring to the drawing in detail, 10 represents the casing of a water heater which may be of any suitable size and shape and which is air-tight when its door is closed, except for the vent at the top to provide an escape for the products of combustion, and an aperture 11 at the bottom around the burner 12 and which permits the entrance of just sufficient air to properly mix with the gas to effect complete combustion and to keep the burner cooled. The burner 12 is of the type shown in my Patent No. 1,233,779 and comes just flush with the floor of the casing 10. The usual water coil is shown at 13.

The preferred form of combustion chamber shown in Figures 1 and 2 comprises a series of sections 14 made of some clay product or other ceramic or chemical ware, such for instance, as the ring support for inverted gas mantles. Each section 14 comprises an outer wall or ring 15 having bars 16 running crosswise and with intersecting bars forming flues 17. Round openings 17^a provide communication between the flues. The bars 16 and 17 are provided with baffle teeth 17^b. The ring 15 of the lowest section 14 is considerably deeper than the bars 16 and 17 so as to provide a space 18 between the burner mouth and this first set of baffling devices.

Beginning with the third member 14 or some higher one, the rings 15 are provided with side openings 19 to permit escape of of some of the products of combustion, and the outer surface of the top section, which has a dome-like shell 20 is provided with these openings 19 so that the balance of the products of combustion may escape and be forced out through the vent at the top of the heater.

Each of the various sections 14 is formed in a single piece by being pressed in a die or mold, as is well understood in the art; and each is provided on one face with dowel holes and on the other with dowel pins 21. These dowels attach the various sections together when in place.

It will be seen that the gas in passing up through the various vertical flues and teeth will be finely divided and mixed with the air so as to effect complete combustion and that the ceramic material will absorb this heat and the heat of the vertical flues and baffle teeth will itself aid further combustion in the chamber. Also the baffling of the gas before contact with the cold coil 13 prevents formation of soot and the condensing of water on the coil. The heat having been taken up by the sections 14 is given off by them and effects a very rapid and efficient heating of the coil 13.

For use with natural gas which has greater pressure and consequently a greater number of heat units per unit of volume, it

has been found that the chamber shown in Figure 3, which is in many ways an improvement on my Patent No. 1,237,780, may be used with great advantage. This form of chamber is shown as comprising three dome-like sections 25, each larger than the other so as to form a triple baffle, and each provided with a solid base portion 26 and with top portions 27 perforated at 28 and having inwardly projecting baffle teeth 29. The sections 25 are of course made of ceramic or chemical ware and may be either secured to each other at the base or left separate as teeth 29 will determine proper spacing.

While I have described what is deemed to be the most desirable embodiment of my invention, it is obvious that many of the details may be varied without in any way departing from the spirit of my invention, and I therefore do not limit myself to the exact details of construction herein set forth nor to anything less than the whole of my invention limited only by the appended claims.

What is claimed as new is:—

1. A combustion chamber comprising a plurality of separable sections of ceramic material provided with staggered baffling elements and adapted to effect disintegration of the gas burned in said chamber and the extraction of the heat resulting therefrom.

2. A combustion chamber comprising a plurality of separable ceramic sections each having a shell portion and a plurality of baffle elements supported by said shell portion.

3. A combustion chamber comprising a plurality of separable ceramic sections each having a shell portion and comprising a number of flue elements disposed at right angles to each other and supported by the said shell portion.

4. A combustion chamber comprising a plurality of separable ceramic sections each having a shell portion and comprising a number of vertical flue elements formed with communicating spaces between said vertical flue elements and supported by the said shell portion.

5. A combustion chamber comprising a plurality of separable ceramic sections each having a shell portion and a plurality of baffle elements supported by said shell portion, and a plurality of dowel elements for securing said sections together.

6. A combustion chamber comprising a plurality of separable sections, each of said sections comprising a plurality of baffles arranged parallel with the axis of the burner, the baffles of each section arranged in staggered relation to the baffles of adjacent ones of said sections, and each of said baffles comprising a tooth or teeth projecting into the flue defined by such baffle as and for the purpose specified.

In testimony whereof I have affixed my signature.

JOHN HICKS.