

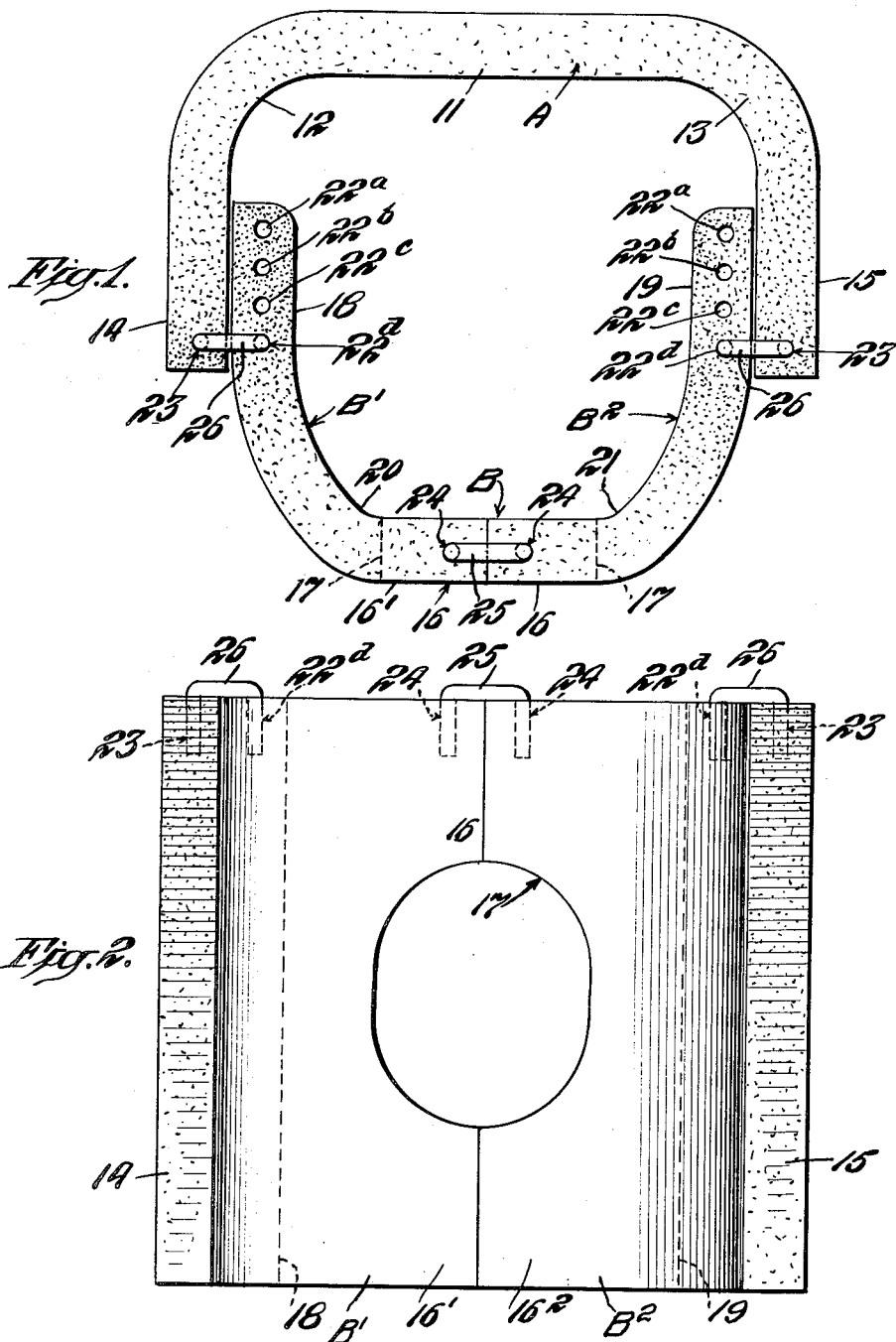
Feb. 20, 1945.

F. CHRISTENSON

2,370,008

PREFABRICATED CERAMIC COMBUSTION CHAMBER

Filed Oct. 28, 1943



INVENTOR.

FRANK CHRISTENSON

BY

Hauffell Varland.

ATTORNEY

## UNITED STATES PATENT OFFICE

2,370,008

## PREFABRICATED CERAMIC COMBUSTION CHAMBER

Frank Christenson, Jamaica Estates, N. Y.

Application October 28, 1943, Serial No. 507,971

3 Claims. (Cl. 158—1)

The present invention relates to ceramic combustion chambers for use in liquid fuel burning installations, and more particularly to prefabricated ceramic combustion chambers which can be installed in existing furnaces especially for the purpose of converting a solid fuel burning furnace into a liquid fuel burning furnace.

One object of the invention is to provide a ceramic combustion chamber which, notwithstanding its considerable wall thickness, can be adapted to furnaces of different sizes and to various types of combustion conditions.

Another object of the invention is to provide a prefabricated adjustable ceramic combustion chamber which can be fitted accurately into an existing furnace.

A still further object of the invention is to provide a thick walled ceramic combustion chamber comprising several relatively adjustable sections and means for securing such sections together in their proper adjusted positions even where the walls of one section are arranged in direct contact with the inner wall of the furnace.

Still another object of the invention is to provide a prefabricated ceramic combustion chamber which, in spite of the considerable thickness of its walls, can be easily introduced into and assembled in the limited space available in an existing furnace.

Still a further object of the invention is to provide a prefabricated ceramic combustion chamber having telescoping parts which can be adjusted to change the size of the combustion room by varying its width as well as its depth.

These and other objects, which will appear more clearly as the specification proceeds, are accomplished by the arrangement and combination of elements set forth in the following detailed description, defined in the appended claims and illustratively exemplified in the accompanying drawing in which:

Fig. 1 is a top view of a ceramic combustion chamber according to the invention, and

Fig. 2 is a front elevation of the combustion chamber of Fig. 1.

Referring now to the drawing, the combustion chamber consists substantially of two U-shaped sections formed of refractory material and denoted generally A and B.

The rear section A comprises a straight vertical rear wall 11 and, integral with said rear wall and connected therewith by rounded cornerpieces 12 and 13, two parallel vertical side walls 14 and 15. The rear wall 11, cornerpieces 12, 13 and side walls 14, 15 have, in the embodiment shown,

a uniform wall thickness of 1½ inches, but any wall thickness between about 1 and about 2 inches or more would give satisfactory results.

The front section B comprises a front wall 16 with a central firing aperture 17, and two parallel side walls 18 and 19 connected with the front wall 16 by the rounded corner pieces 20 and 21. The wall thickness of the front section B is the same as that of the rear section A, but the overall width of the front section between the outer surfaces of the parallel walls 18 and 19, is slightly less than the distance between the inner faces of the parallel side walls 14 and 15 of the rear section A, so that the front section B can be telescoped with its side walls 18, 19 between the side walls 14, 15 of the rear section A.

Each side wall 18 and 19 is provided in its top with a series of spaced vertical holes 22a, 22b, 22c, 22d arranged substantially along its center line, and each side wall 14, 15 is provided in its top near its outer end with a single vertical hole 23.

In the embodiment illustrated, the front section B of the combustion chamber is subdivided on a vertical line through the centers of the front wall 16 and of the firing aperture 17 into two half sections B<sub>1</sub> and B<sub>2</sub>, one of which B<sub>1</sub> includes one half 16<sup>1</sup> of the front wall, a cornerpiece 20 and a side wall 18, while the other half section B<sub>2</sub> comprises the other half 16<sup>2</sup> of the front wall 16, the cornerpiece 21 and the side wall 19. Each half, 16<sup>1</sup>, 16<sup>2</sup> of the front wall 16 is provided in its top near the dividing line with a vertical hole 24.

The combustion chamber according to the invention is introduced into an existing furnace and assembled therein as follows:

The holes 22a to 22d are so arranged with respect to the holes 23 that at maximum overlap between the walls 18, 19 and 14, 15 respectively the rear edges of the walls 18, 19 are spaced from the vertical plane defined by the inner surface of the rear wall 11 a distance which exceeds twice the thickness of the walls. Thus, the combustion chamber according to the invention comprises in each adjusted position a forward space of less width and a rear space of greater width. In the embodiment illustrated the rear space of the combustion chamber has at maximum overlap of the front and rear sections a depth of about 4½ inches.

First the rear section A is introduced into the empty furnace and secured in position. Since it would thereafter be difficult to introduce the

front section B as a complete unit into the limited space left in the furnace and to manipulate it in this space into the proper position, the halves B<sub>1</sub>, B<sub>2</sub> of the front section are inserted separately and positioned with respect to the rear section. Since the side walls 18, 19 extend between the side walls 14, 15, the front sections B<sub>1</sub>, B<sub>2</sub> can be properly placed even if the rear section A occupies the total width of the furnace. The depth of the combustion chamber and to some extent its width can be varied by properly choosing the amount of overlap between the side walls 14, 15 and 18, 19, respectively. When all the parts have been properly positioned and adjusted the two halves B<sub>1</sub> and B<sub>2</sub> of the front section are secured together by inserting the legs of a U-shaped clip or staple 25 from above into the two holes 24. Similarly the front and rear sections of the combustion chamber are secured together by inserting the legs of a U-shaped clip or staple 26 into a hole 23 in one or both of the side walls 14, 15 and one of the holes 22a to 22d of the adjacent side wall 18, 19. This can be done without any difficulty even if the outer faces of the side walls 14, 15 are in direct contact with the furnace wall. Thus the prefabricated thick walled ceramic combustion chamber according to the invention can be easily adjusted to existing furnaces of various sizes and can be installed and assembled in a very limited space.

I claim:

1. A prefabricated ceramic combustion chamber for use in liquid fuel burning installations comprising a generally U-shaped rear section made of refractory material and including a vertical rear wall and parallel vertical side walls, all having a uniform thickness in excess of 1 inch, a generally U-shaped front section formed of refractory material and having approximately the same wall thickness as said rear section, said front section including a front wall provided with a firing aperture and parallel vertical side walls adapted to telescope between the side walls of said rear section, at least one side wall of one of the sections having a series of spaced vertical holes provided in its top on a line parallel to its top edges and the corresponding side wall

of the other section being provided in its top with a similar vertical hole, and a U-shaped clip adapted to be inserted with one of its legs in one of the series of holes in the side wall of said first section and with its other leg in the hole in the side wall of said other section.

2. A prefabricated ceramic combustion chamber for use in liquid fuel burning installations comprising a generally U-shaped rear section made of refractory material and including a vertical rear wall and parallel vertical side walls, all having a uniform thickness in excess of 1 inch, a generally U-shaped front section formed of refractory material and having approximately the same wall thickness as said rear section, said front section including a front wall provided with a firing aperture and parallel vertical side walls adapted to telescope between the side walls of said rear section, means to secure said front and rear sections together in a selected one of several relative positions, said front section including two separate half sections arranged on opposite sides of the vertical line extending centrally of said front wall, each half section being provided in its top adjacent said separating line with a vertical hole, and a U-shaped clip having its legs inserted in said vertical holes.

3. A prefabricated ceramic combustion chamber for use in liquid fuel burning installations comprising a generally U-shaped rear section made of refractory material and including a vertical rear wall and parallel vertical side walls, all having a uniform thickness in excess of 1 inch, a generally U-shaped front section formed of refractory material and having approximately the same wall thickness as said rear section, said front section including a front wall provided with a firing aperture and parallel vertical side walls, means to secure said front and rear sections together, said front section including two separate half sections arranged on opposite sides of the vertical line extending centrally of said front wall, each half section being provided in its top adjacent said separating line with a vertical hole, and a U-shaped clip having its legs inserted in said vertical holes.

FRANK CHRISTENSON.