Feb. 15, 1944. D. KAUFMAN 2,341,622

COMBUSTION CHAMBER

Filed Jan. 23, 1943

Fig. 1.

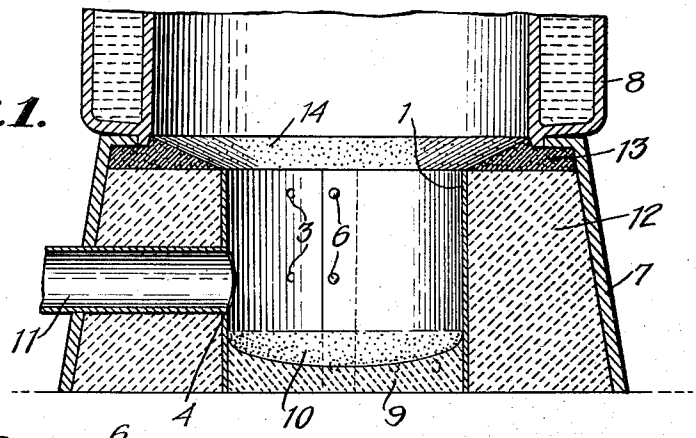


Fig. 2.

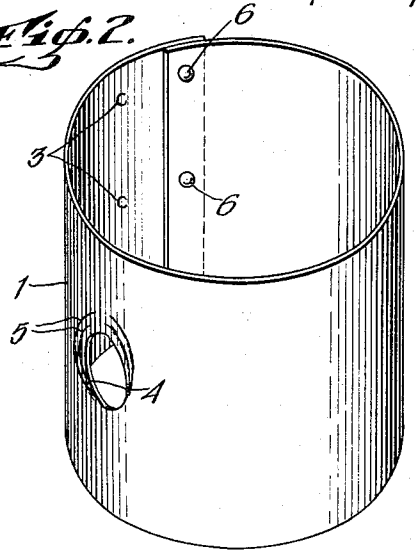


Fig. 3.

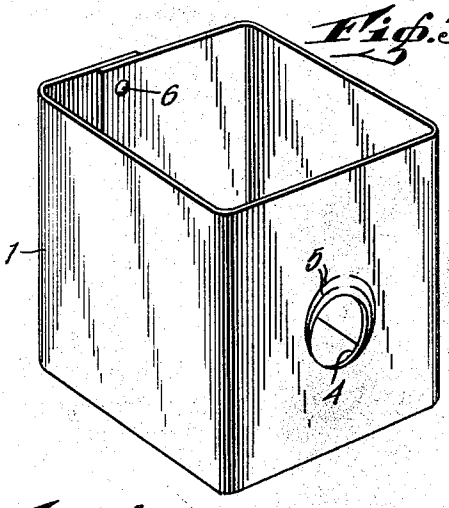
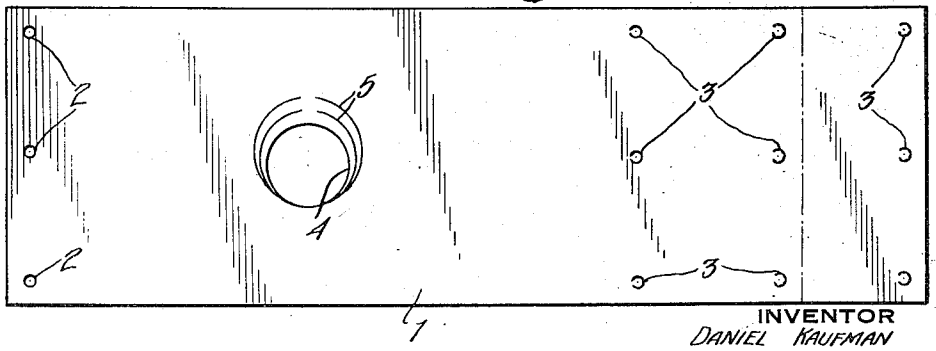


Fig. 4.



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COMBUSTION CHAMBER

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3 Claims. (Cl. 158—1)

This invention relates to a new and improved combustion chamber, designed particularly for use with domestic boilers and furnaces, utilizing the so-called gun-type oil burner, in which liquid fuel is atomized and wherein the combustion chamber is supplied with air sufficient to support combustion.

An object of the invention is to provide a combustion chamber formed from a single piece of flexible metal that is adapted to be coiled, folded (or formed) into various sizes and shapes and positioned when the boiler is initially installed or thereafter, with the minimum skill and inconvenience.

The walls of the combustion chamber are usually made of ceramic material, generally fire brick or the like. Such a chamber has been found objectionable for several reasons. One such reason is the fact that the fire brick must be placed one at a time when the boiler is initially installed and cannot be positioned thereafter except with the greatest difficulty. Other reasons are that the ceramic walls are slow to heat and equally slow to cool, and a substantial portion of the heat generated is absorbed by the fire brick, hence time is required to heat the fire brick before the boiler begins to function as a heating plant. Attempts to overcome these disadvantages have been made by using combustion chambers of metal. Such chambers have also proven objectionable because composed of several independent parts. The hereinbefore mentioned and other objections to the conventional combustion chamber are overcome in this invention.

This new and improved combustion chamber is made of a single piece of metal, that is easily shaped, by coiling or folding, to a predetermined shape and size.

Objects other than those hereinbefore outlined will become apparent from the accompanying drawing and the following description.

To these and other ends this invention consists of a combustion chamber constructed substantially as shown in the accompanying drawing, and as hereinafter more particularly described.

Referring to the drawing in which like numerals of reference indicate like parts in the several figures.

Figure 1 is a cross sectional view of the lower portion of a boiler or furnace, having this improved combustion chamber associated therewith;

Figure 2 is an enlarged perspective view of one form of combustion chamber;

Figure 3 is a view similar to Figure 2, with the combustion chamber differently shaped; and

Figure 4 is a view of the plate from which the combustion chamber is formed.

The combustion chamber described herein differs from the combustion chambers in the prior art in that it is constructed of a single sheet of metal, preferably stainless steel, which is coiled or folded into its final shape and size, such as shown in Figures 2 or 3, or other desirable shapes and positioned in the boiler when the latter is initially installed or later if necessary.

In the drawing the numeral 1 indicates the plate from which the combustion chamber is made. As shown it is rectangular in shape, relatively thin, and preferably made of a heat resistant metal such as stainless steel. It is provided with a plurality of fastening apertures 2 near one short edge a plurality of series of parti-apertures 3 near the opposite short edge and an aperture 4 therethrough, to receive one end of a blast tube 11 through which projects a gun type burner (not shown) of a well known conventional form. Eccentric with the aperture 4 are a plurality of scored portions 5 so as to form a series of interconnected knock-out strips. These latter are designed to provide means for quickly and easily increasing the area of the aperture 4 to various sizes by breaking off the plate on one of the scored lines 5. Likewise the apertures 3 are outlined in part by scored lines, and the material within the lines is easily removed by a slight lateral pressure and broken off on the unscored portion. Thus only such of the series of parti-apertures 3 as are required to secure the ends of the plate are used, and the apertures in the remaining series remain closed. Thus the walls of the combustion chamber remain solid at the same time providing means for varying the points where the ends are secured together. The chamber is formed from the plate 1 by coiling or folding it into a cylindrical or other shape, and its ends secured by bolts, rivets or the like, which pass through apertures 2 and one of the series of parti-apertures 3, depending upon the size of the finished chamber. Instead of coiling the plate as for a cylindrical chamber, as in Figure 2, it may be folded into any one of numerous shapes, one of which is shown in Figure 3. The numeral 7 indicates the base frame of a boiler which supports a water jacket 8, both being of a conventional type. The combustion chamber is positioned in the approximate center of the base frame 7 either before the water jacket 8 is assembled therewith or thereafter. In the

latter case the chamber is projected through the fire door. If such door is too small the plate is passed through the door and the chamber is shaped inside the water jacket. When positioned, substantially as shown in Figure 1, the floor of the chamber is preferably covered with a refractory cement 9, the top 10 of which is usually concaved. The blast tube 11 is positioned with its inner end fitted into the aperture 4. The space between the combustion chamber and the wall of the base frame 7 is filled with an insulation material 12 such as rockwool, asbestos, mica, etc. On this insulation filler is a cement cap 13, the top of which is shaped to form an inwardly and downwardly flaring face 14.

As this combustion chamber is made of one piece of metal it requires the minimum space for storage before installation, and being adapted to provide all conventional sizes, only one plate is required in stock for any domestic boiler.

What is claimed:

1. A conformable combustion chamber for heating units, including a substantially rectangular body formed of a single strip of metal adapted to be bent into varying forms from end to end upon itself and having a series of spaced alined, fastener receiving openings adjacent each of its ends adapted to register with each other when said ends are moved into overlapping contacting relation, said body having a burner receiving opening disposed intermediate the ends thereof, and said burner opening being surrounded by a plurality of interconnected knockout strips integrally connected to said body.

2. An adjustable and conformable combustion chamber for heating units, comprising a metal blank of substantially rectangular configuration adapted to be bent into varying forms from end to end upon itself and having a plurality of transversely extending spaced rows of spaced openings adjacent one of its ends, a single transversely extending row of spaced openings adjacent its opposite end adapted to be selectively alined with any one of the first mentioned rows of openings, a burner receiving opening formed in said blank between the first and second named transversely extending rows of openings, and a plurality of interconnected knock-out strips integrally connected to the blank and forming a part thereof and extending into said burner receiving opening.

3. An adjustable and conformable combustion chamber for heating units, comprising a flexible metal blank of substantially rectangular formation adapted to be bent into varying forms from end to end upon itself and having a row of transversely alined spaced fastener receiving openings adjacent each of its ends adapted to be alined with each other when said blank is bent so as to move the ends thereof into overlapping contacting relation, and said blank having a burner receiving opening formed therein between said rows of transversely extending spaced openings, and a plurality of interconnected knock-out strips formed from said blank and integrally connected thereto and extending into said burner receiving opening, whereby burners of varying predetermined sizes may be projected through said burner opening upon removal of a predetermined selected knock-out strip.

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