April 12, 1938. R. A. FREVERT ET AL 2,114,018

APPARATUS FOR HEATING

Filed Feb. 17, 1937

Fig. 1,

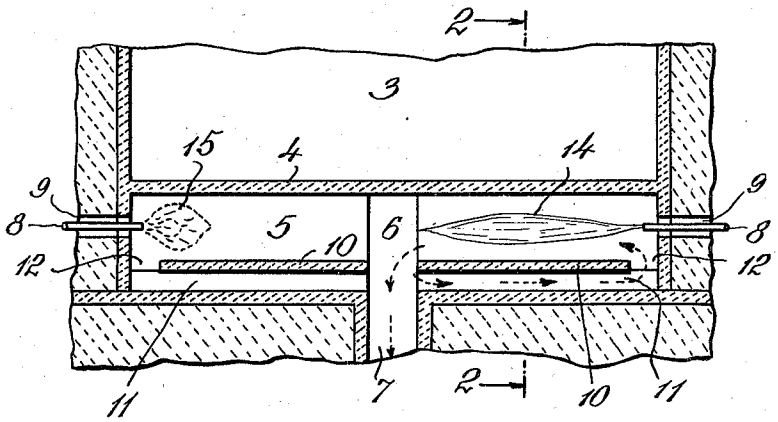
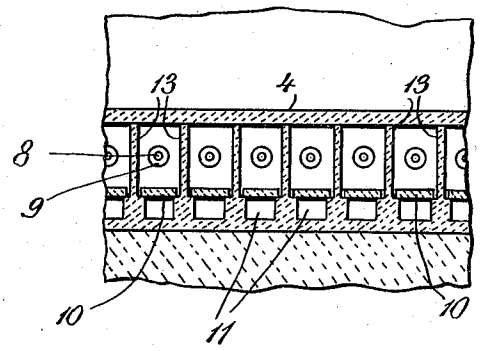


Fig. 2,



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Patented Apr. 12, 1938 2,114,018

UNITED STATES PATENT OFFICE

2,114,018

APPARATUS FOR HEATING

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Application February 17, 1937, Serial No. 126,145

1 Claim. (Cl. 202—151)

This invention is directed to heating ovens and the like, wherein heat is applied by an open flame in a flue placed below the refractory, heat transmissive floor of the oven and to similar heating installations. It is particularly applicable for use with coking ovens of the type set forth in U. S. Patent #1,805,711 to Charles Andrews, where the oven is used for the coking of liquid oils.

A fundamental requirement of the heating of such equipment is that the distribution of heat over the area to be heated is uniform. The usual method of attempting to secure this uniformity is by heating with a large number of small flames, each in its own flue. This has the advantage of breaking up the flame concentration, but each individual flame still has its own point of heat concentration and the result is a number of points of high heat intensity upon the bottom of the oven, each smaller in area, but each of the same high intensity.

The object of this invention is to provide a method and apparatus for the heating of such equipment capable of securing a more even distribution of heat along the length of a heating flue provided for the direct heating of an enclosure.

This invention is based upon the dicovery that with a properly constructed flue passage and auxiliary passage, the flame will be capable of aspirating and recirculating a certain proportion of flue gas, which will greatly lengthen the flame, cause it to be of equal intensity throughout its length, do away with the high intensity flame burst, and be largely self-controlling in operation.

In order to readily understand this invention, reference is made to the drawing attached to this specification, the two figures of which show sectional views of an oven constructed for the practice of this invention. Referring to Figure 1, 3 is the oven chamber, of which 4 is the refractory floor, underneath which there are a series of heating flues 5, placed transversely, two of which are shown in Figure 1. Each flue begins at the side wall of the structure and extends nearly to the center of the floor, the remaining space 6 being open to permit communication between the heating flue 5 and the exhaust or stack flue 7. Fuel (gas or oil) is introduced at the base of the heating flue 5 by burner 8, extending through port 9. Burner 8 and port 9 may be so designed that the air necessary for combustion enters through 9 or 9 may fit 8 tightly and the fuel and combustion air be premixed before entry. Flue 5 is fitted with a false bottom of refractory material 10, defining a passage 11, which communicates at one end with stack flue 7 and at the other with the rear end of flue 5. The false floor piece 10 may be positioned as desired to adjust the width of opening 12. Referring to Figure 2, which is a section taken at 2—2 in Figure 1, it is clearly seen how the flues 5 are arranged below the floor 4, divided by partition walls 13, and how the false floor piece 10 is supported upon ledges in partitions 13 to define passage 11.

In operation, the aspirating effect of the fuel entering through burner 8 will cause a continual recirculation of stack flue gases through passage 11 into the rear end of the combustion space. These flue gases will reduce the oxygen content at this point, and force the flame to assume an elongated form, free from areas of intense temperature, and to deliver its heat evenly over the whole length of combustion flue 5 by a flame of the general character denoted in the drawing at 14, Figure 1. In the absence of such recirculation, if the proper amount of air is admitted for complete combustion, the flame will assume the form of a rather short flame burst of quite intense heat, as shown in dotted outline at 15, Figure 1. The heat from this flame will be largely delivered to that portion of the floor 4 immediately over the outer end of flue 5, with the central portion of the floor 4 being less intensely heated.

The amount of recirculation desirable for any fuel or combination of fuels will differ somewhat from that desirable for other fuels. To this end, as well as to permit initial adjustment, we prefer to make false floor 10 of a single piece of refractory and slidably mount it on the shoulders in the walls 13. Then it may be properly adjusted by working with a hook through port 9. Once set for a particular fuel or group of fuels of similar requirements, the amount of recirculation is essentially constant for all variations in loading, since the burning of more fuel increases the aspirating effect a proportionate degree.

Due to the evenness of heat distribution, the use of this invention not only gives better control of the operation being carried on in the oven 3, but gives a very much greater life to the refractory oven floor, relieving it of stresses caused by uneven intensity of heating.

We claim:

In an oven structure, an oven chamber, a heat transmissive refractory floor therefor, lateral combustion flues therebelow, fuel and air inlet means for each flue, a stack passage for products of combustion, partition walls defining said flues, shoulders on said partition walls above the bottom of said flues, laterally movable refractory pieces resting on said shoulders and dividing said flue into an upper flue for passage of combustion flame from burner to stack, and a lower passage for recirculation of flue gases from stack to burner.

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