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ELECTRIC OVEN

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Fig. 1.

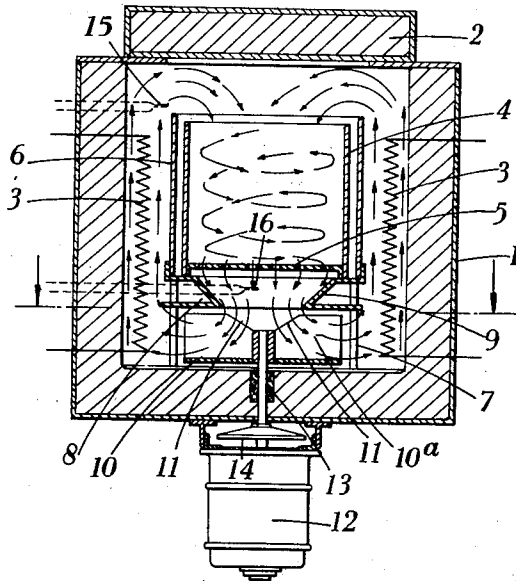
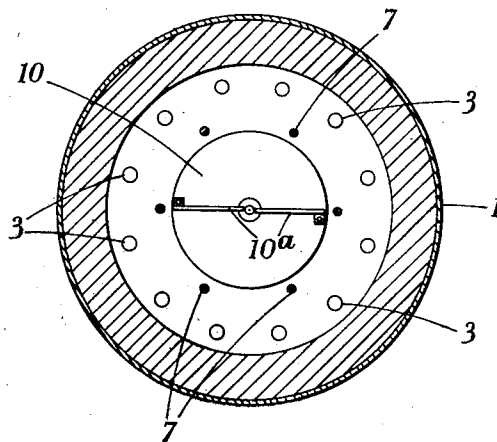


Fig. 2.



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# UNITED STATES PATENT OFFICE

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## ELECTRIC OVEN

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In Great Britain November 11, 1932

### 1 Claim. (Cl. 219—35)

This invention relates to electric ovens.

Forms of oven have already been employed in which a circulating fan of the centrifugal type collects the air within the oven axially and projects it horizontally outwards against the walls of the oven. By using an appropriate fan it was found that a whirling action could be given to the air which is thus (assuming that the fan is below the work) caused to rise with substantial turbulence effect in whirls past the heaters and it then descends still with considerable turbulence through the work contained in a suitable container or basket preferably immediately above the fan.

It has now been found that still further increased efficiency is obtainable by using certain specific arrangements in connection with the fan. Broadly the object of the invention is to provide such arrangements, the nature of which and the further more specific objects of the invention will appear from the subsequent description. In particular it seems that undesirable turbulence effects can be avoided and the desired turbulence through the work increased by using a revolving plate immediately adjacent to the edges of the fan blades while still leaving the delivery free in all directions radially. It is also found advantageous to place a guiding ring between the basket or the like containing the work and the fan delivery, this ring extending from the basket close to the fan blades: it is preferably coned to restrict the fan inlet to a circle of approximately one half of the full diameter of the fan and may terminate in a flat plate lying close to and extending preferably beyond the edges of the blades; the central portions of the blades may be tapered towards the center away from the cone and the blades themselves are preferably flat and radial and may be two or more in number and of substantial diameter (preferably almost the full diameter of the basket) bringing their edges relatively close to the oven walls.

The invention is illustrated by the accompanying drawing in which

Figure 1 is a sectional elevation, and

Figure 2 is a horizontal section through the oven just above the fan.

The oven 1 as shown is of cylindrical shape provided with a heat resisting lining and a cover 2. The electrical heating elements 3 are disposed at intervals near the periphery of the oven and a basket 4 provided with a perforated bottom 5 contains the work. An outer cylinder 6 prevents

direct radiation of heat on to the work, and ensures that heating thereof shall take place by convection due to the movement of the air.

The basket 4 and outer cylinder 6 are supported by means of columns 7 and the fan 10, 10a is disposed at the bottom of the oven.

A ring 9 shaped as a frustrum of a cone extends over substantially the whole bottom of the basket and terminates at its lower end in the flat plate 8 which extends out beyond the columns 7 and leaves an inlet opening to the fan of approximately half the full diameter of the latter. The fan has its radial blades 10a rising from a bottom plate 10. The combination of the ring and the bottom plate very largely prevents return currents and loss of efficiency. The central portions of the blades are tapered down towards the bottom at 11 to meet the central boss of the fan and to facilitate the entry of and centrifugal action upon the air entering the fan.

As shown the fan is driven by an electric motor 12 and a stuffing box 13 is provided packed with asbestos or other suitable material. A copper or other good heat conducting disc 14 outside the furnace is arranged upon the motor shaft so as to dissipate heat coming down the shaft from the oven and prevent it from affecting the motor or its bearings.

Two thermo couples 15, 16 are shown one above and one below the basket. When these indicate the same temperature it gives an indication that this is also the temperature of the work since the circulating air is no longer losing heat in its passage past the work in the basket.

I claim:—

In a furnace, the combination of a basket containing the work and having a reticulated floor, a fan drawing air through the basket, the fan comprising a revolving disc remote from the basket and blades fixed thereto, a duct covering substantially the whole area of the basket and leading to a restricted area at the center of the fan, a fixed plate at the end of the duct adjacent to the fan extending out to substantially the full diameter of the fan, an outer cylinder surrounding the basket, heating elements in an annular space surrounding the outer cylinder, the delivery of the fan being substantially free in all directions to deliver the air drawn through the work into the annular space containing the heating elements and thence to the opposite end of the basket.

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