

R. OKRASSA.

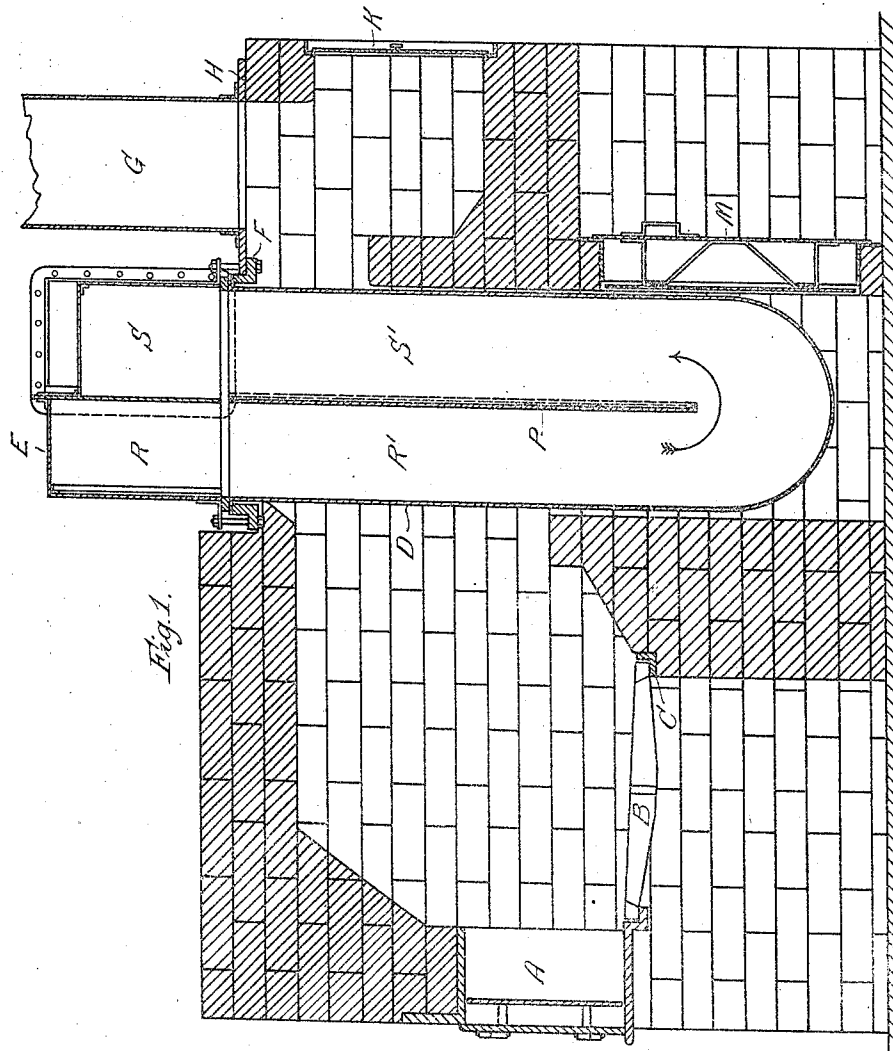
FURNACE.

APPLICATION FILED DEC. 16, 1911.

1,034,495.

Patented Aug. 6, 1912.

2 SHEETS—SHEET 1.



WITNESSES

John H. Stoving.
Alfred R. Anderson

INVENTOR

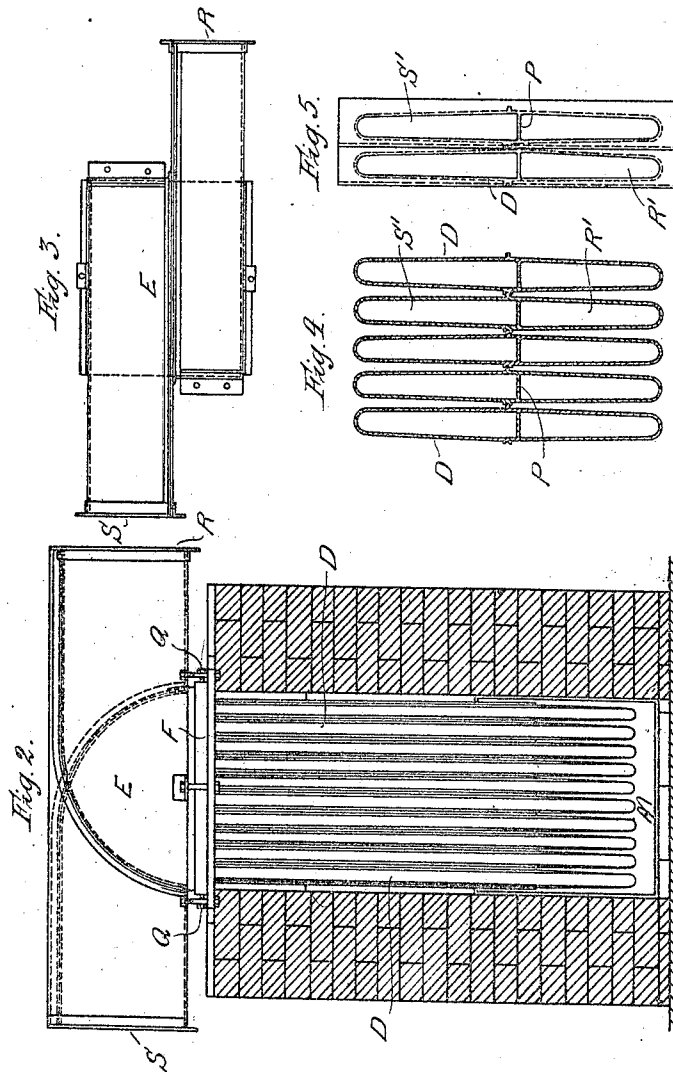
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WITNESSES

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ROBERTO OKRASSA, OF ANTIGUA, GUATEMALA.

FURNACE.

1,034,495.

Specification of Letters Patent.

Patented Aug. 6, 1912.

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To all whom it may concern:

Be it known that I, ROBERTO OKRASSA, a subject of the German Emperor and King of Prussia, and residing at Antigua, Guatemala, Central America, have invented a certain new and useful Improvement in Furnaces, of which the following is a specification.

This invention relates to a construction of apparatus for preheating the air required for combustion in furnaces and has for its primary object to provide for the utilization to the greatest advantage of the heat capable of being abstracted from the hot gases of combustion and thereby to effect economy of fuel.

A further object is to provide a construction of great simplicity which presents no difficulty in the mounting of the heater masonry, which can be kept clean with the greatest of ease and which is incapable of getting out of order.

The apparatus is illustrated in the accompanying drawing in which—

Figure 1 is a longitudinal vertical section of apparatus embodying the invention; Fig. 2 is a cross section, on a smaller scale, through the air heater chamber which is disposed intermediate the combustion chamber and the outlet for the products of combustion; Fig. 3 is a plan of a casing affording an inlet and an outlet for the air which passes through the heater; and Figs. 4 and 5 are a horizontal section and a plan, respectively, showing tubular members of the air heater.

Referring to the drawings, the furnace is provided with a furnace front arranged as usual, as shown at A, and fitted with a door and dead plate; B denotes the fire bars; C denotes the back bearer, all the said parts being constructed and arranged as usual.

D denotes vertical tubular members disposed in a row the ends of which communicate with an air inlet and outlet casing E and which members are suspended by means of flanges from the frame F. The tubular members are of elongated cross section, their narrow sides obstructing the path of the gases from the combustion chamber to the outlet.

G denotes the chimney mounted on the base-plate H; K denotes the flue door and M the cleaning door extending the whole width of the furnace, as shown in Fig. 2.

The tubular members D are divided into

compartments of unequal capacity by internal depending webs or partitions P each disposed parallel with the minor axis of its tubular member (Figs. 1, 4 and 5) say for seven-ninths of their entire length and the broad sides of adjacent tubes are in wedge-shaped rib and groove engagement with each, as shown in Figs. 4 and 5, whereby they are spaced apart, the rib and groove on the body of each tubular member being of the same length as the internal web P. As aforesaid, the tubular members D are suspended from the frame F (Figs. 1 and 2) and are kept in close contact by means of pinching pins Q (Fig. 2), expansion or contraction being permitted.

The casing E is divided into two compartments of unequal capacity affording an air inlet R and an air outlet S, as shown in Figs. 1, 2 and 3, the widths of the air inlet and of the air outlet corresponding to the width of the compartments R' and S' in the tubular members. The casing E is disposed above the flanges of the tubular members, and is bolted to the frame F; a joint being interposed between the frame and the casing.

Cold air enters the casing at R and is blown down through the compartments R' beneath the webs P, in the direction of the arrow, thence upward through the compartments S' to the outlet S. During the passage of the air through the tubular members D and casing E, the hot gases from the furnace are directed against the members D at their junction with each other, drawn downward in the direction indicated, and finally passed upward through the chimney into the atmosphere. The air passing through the tubular members D is heated by the hot gases, and in expanding is allowed greater space in the exits of said members and casing E.

What I claim is:—

1. In combination with a furnace provided with a combustion chamber and an outlet for waste gases, and a chamber disposed intermediate the combustion chamber and the waste gas outlet, a preheater comprising vertical tubular members of elongated cross section disposed in a row in said intermediate chamber, the broad sides of adjacent members being in rib and groove engagement with each other for part of their length, and the narrow sides of said members obstructing the path of the gases from the combustion chamber to the waste gas

outlet, downwardly extending partitions dividing said tubular members internally into compartments, said partitions extending only partly the length of said tubular members so as to permit communication between the compartments, a frame from which said tubular members are suspended, and an inlet and outlet chamber resting on said frame and comprising compartments communicating with the compartments in said tubular members.

2. In combination with a furnace provided with a combustion chamber and an outlet for waste gases, and a chamber disposed intermediate the combustion chamber and the waste gas outlet, a preheater comprising vertical tubular members of elongated cross section disposed in a row in said intermediate chamber, the broad sides of adjacent members being in rib and groove engagement with each other for part of their length, and the narrow sides of said members obstructing the path of the gases from

the combustion chamber to the outlet, downwardly extending partitions disposed parallel with the minor axes of said tubular members and dividing said members internally into compartments of unequal capacity, said partitions extending only part of the length of said tubular members so as to permit communication between the compartments, and being substantially the same length as the ribs and grooves on said tubular members, a frame from which said tubular members are suspended, and an inlet and outlet chamber resting on said frame and comprising compartments of unequal capacity communicating with the compartments in said tubular members.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERTO OKRASSA.

Witnesses:

F. BOTTE,

AUGUSTE-SCHAIRCH.