Sept. 20, 1960 G. P. REINTJES 2,953,364

COAL DRYING FURNACE BREECHING

Filed March 24, 1958 2 Sheets-Sheet 1

FIG. 1

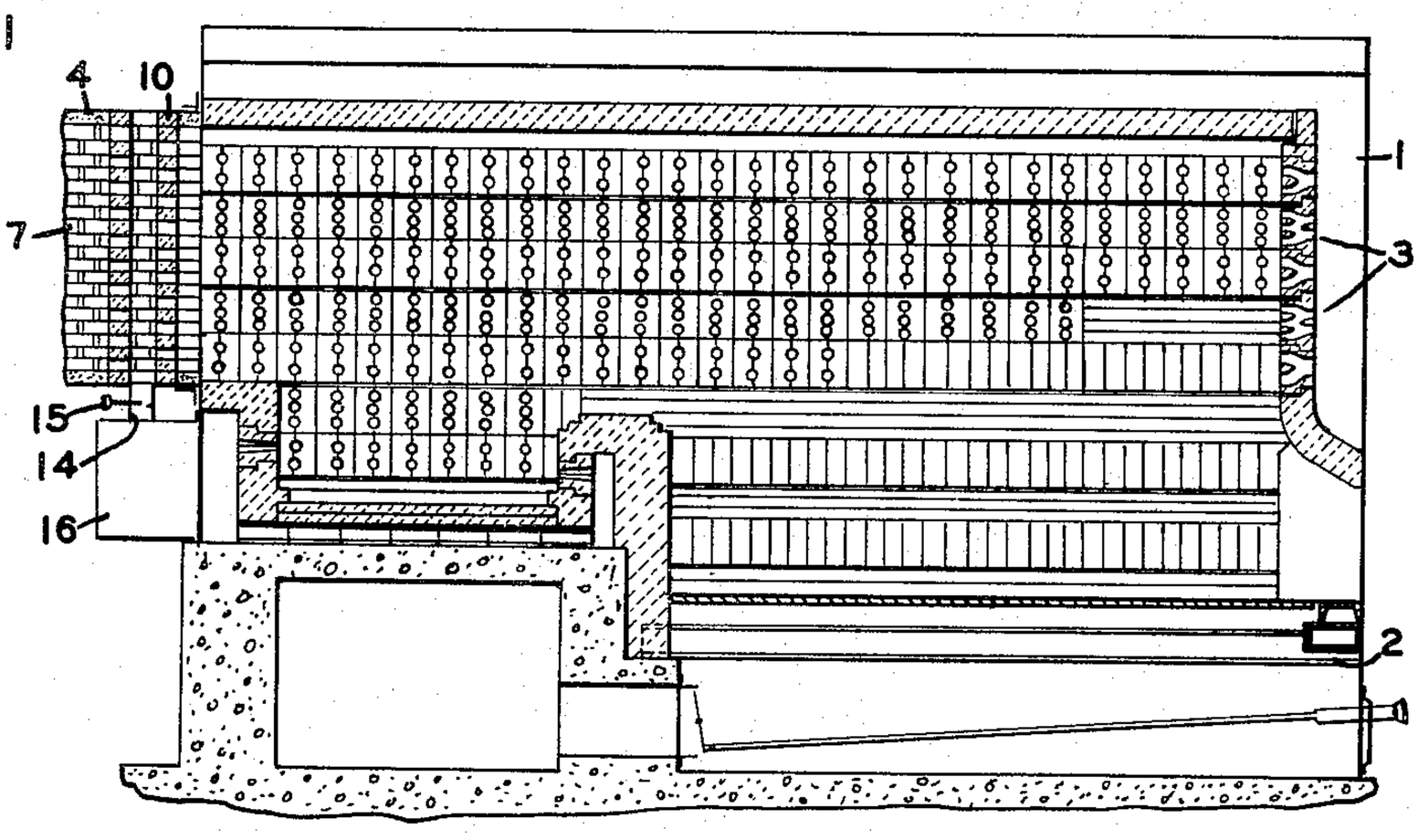
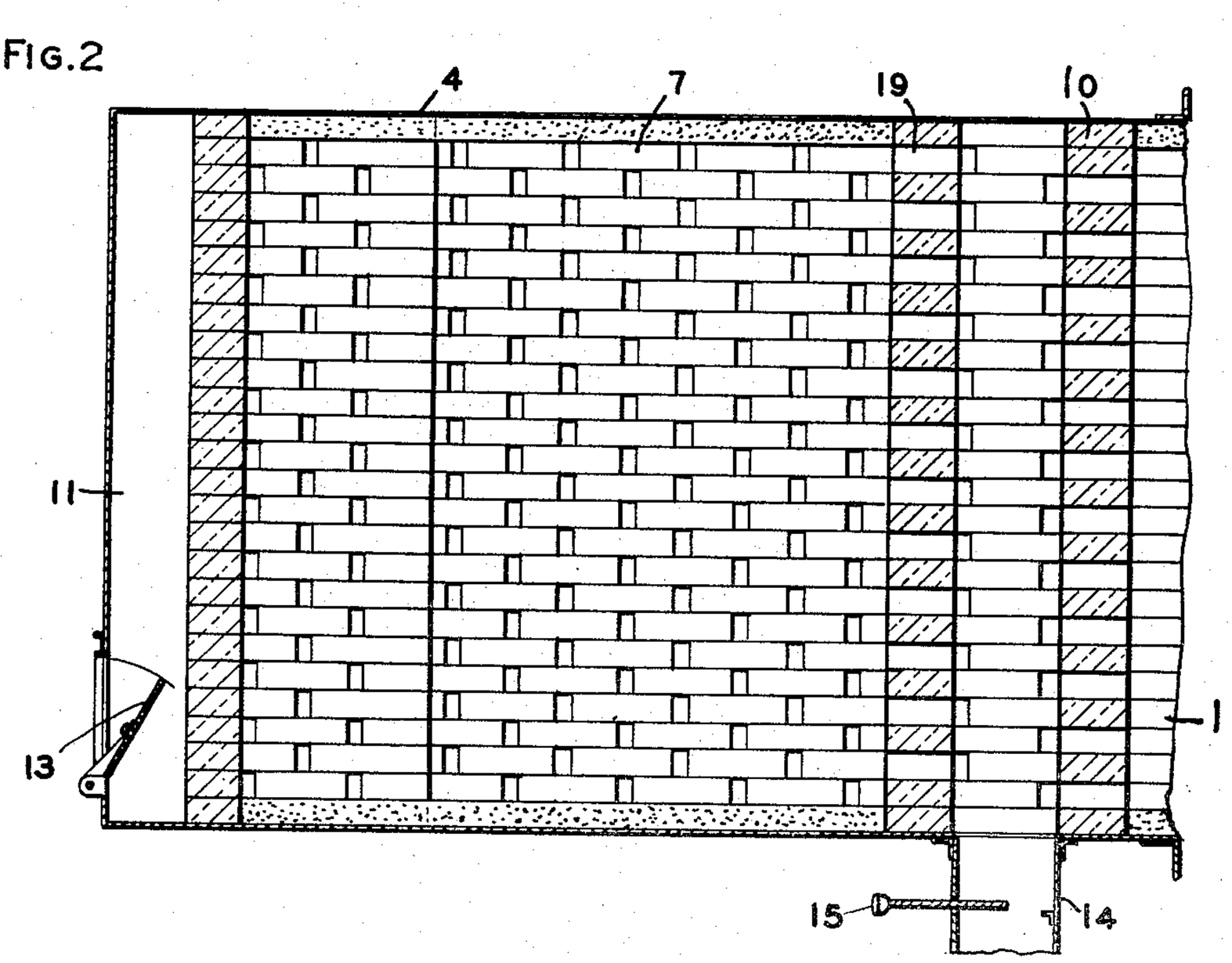


FIG. 2



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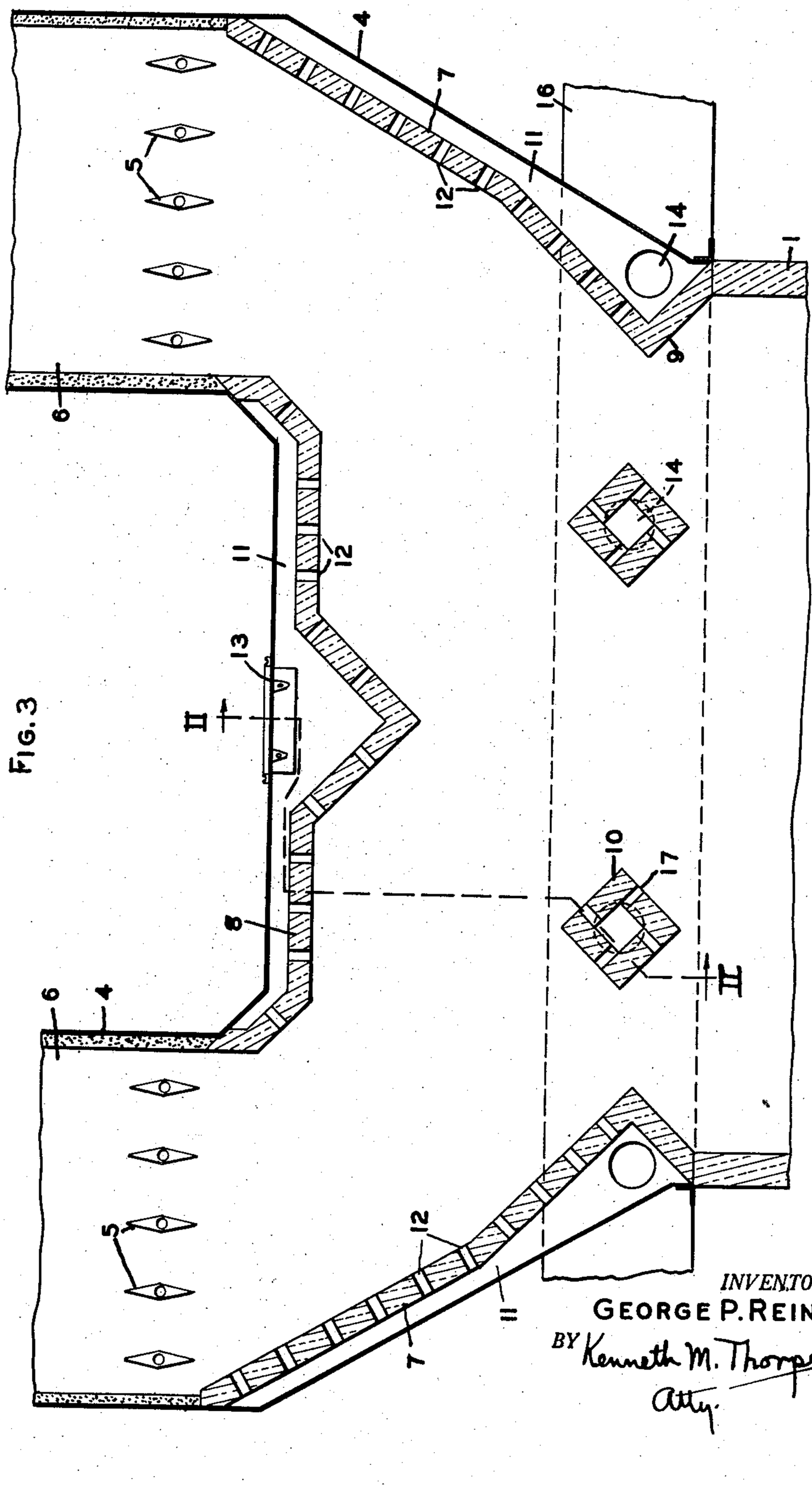

FIG. 3

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COAL DRYING FURNACE BREECHING

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1 Claim. (Cl. 263—19)

This invention relates to air heating furnaces for the drying of coal and similar materials. Coals and the like are dried by air passing over, through or in other ways contacting the material. The moisture in the coal or other material is absorbed by the air and in order to operate efficiently the air is heated to reduce its relative humidity. The chief object of the present invention is to produce means for feeding larger volumes of air than is commonly possible with the usual furnace, such air being mixed with the hot gases to lower their overall temperature and prevent stratification or the production of relatively hot and cool spots. If the air used is too hot it may result in the coking of coal, or in the deterioration of other materials being dried, and in the overheating of the breeching, ducts or control apparatus.

In standard air heating furnaces for coal drying and similar purposes, the square foot area of the side walls through which air is admitted is about the same for a twenty million as it is for an 80 million B.t.u. furnace, the only gain in air inlet capacity being in the front and rear walls of the furnace, but these must be so designed that it is impractical to increase the air inlet capacity in direct proportion to the increase in B.t.u. output. Another object of the invention, therefore, is to provide for the admission of additional air through the breeching of the furnace.

A further object of the invention is to develop a breeching with offsets and screening piers which deflect radiant heat from the furnace and prevent its direct impingement on the dampers, ducts and other parts controlling the flow of air to the drying equipment and also prevent overheating and damage to any parts of the breeching and control equipment.

With the general objects named in view and others as will hereinafter appear, the invention consists in certain new and useful features of construction and organization of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a longitudinal section through an air heating furnace adapted to heat air for the drying of coal or other materials.

Figure 2 is an enlarged section taken through the breeching on the line II—II of Figure 3.

Figure 3 is a horizontal section taken through the breeching.

Referring now to the drawings in detail, where like reference characters identify corresponding parts in all of the figures, **1** is the furnace which is shown by way of illustration and may be modified to suit to the type of fuel and location of gas outlets to the drying equipment, and **2** illustrates the grates of the furnace. The side and front walls of the furnace are lined with tile **3** providing air ports for the entry of air either from within the furnace room or from ducts leading outside the building, as preferred.

This air is mixed with the hot gases produced by

the burning of the fuel and is discharged through a breeching comprising a relatively imperforate housing **4**, having its rectangular inlet connected to the rear of the furnace. Frequently the discharge from the furnace is too hot because of insufficient secondary air, or hot spots occur due to stratification of the air and gases, with the result that the breeching and the damper **5** (two being shown) controlling the outflow to the ducts **6** leading to the drying equipment, are overheated and large maintenance costs ensue.

In order, therefore, to protect the control equipment, breeching and dampers, I have provided the breeching with refractory or tile curtain walls **7** along its sides and back wall **8**. The side walls **7** are preferably formed with an offset or deflector **9** to shield the dampers **5** and discharge ducts **6** from direct radiation from the furnace. As an additional protection against radiant heat, I also may provide one or more refractory or tile deflector piers extending from the bottom to the top of the breeching, said piers being shown at **10**.

In order to provide for the controlled admittance of more air for the tempering of the furnace gases, it is preferable that the walls **7** and **8** be spaced from the casing **4** to provide air passageways **11**, and said walls are provided with a multipilicity of air inlet ports **12**. Air admitted to passageways **11** at the back of the furnace may be controlled by a damper **13**.

The air admitted to the passageways **11** in the side walls may be provided in any suitable way, but preferably, is supplied through ducts **14** controlled by dampers **15**, and may be fed from a longitudinal duct **16** from inside or outside the building, either under natural, induced or forced draft as preferred. By preference, also the piers **10** are hollow and have outlet ports **17**, said piers being connected to ducts **14** controlled by dampers **15**, and fed from the cross duct **16** as shown.

From the above description and drawings, it will be apparent that I have produced a construction embodying all of the features of advantage set forth as desirable, and while I have described and illustrated the preferred construction, it is to be understood that I reserve the right to all changes within the spirit and scope of the appended claim.

I claim:

A breeching adapted for connection to the outlet of a drying furnace to receive the combustion gases from the furnace to decrease the temperature and increase the volume thereof, comprising a substantially imperforate casing having an inlet adapted for connection to the furnace and an outlet adapted for connection to a drying duct, a first damper at the outlet for controlling the flow to the duct, a perforated refractory wall lining said casing and spaced therefrom to form an air passageway between the casing and the refractory wall for substantially uniform air distribution throughout the entire area of the wall, a second damper in the casing for controlling admittance of air to said passageway, and deflectors inclined inwardly from the opposite margins of said inlet in the casing to shield the first dampers from heat radiation admitted through the casing inlet.

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