Aug. 8, 1933. M. J. CONROY 1,921,346

PERFORATED RETAINER PLATE CONSTRUCTION FOR FIRE BRICK WALLS

Filed Oct. 10, 1930

Fig. 1

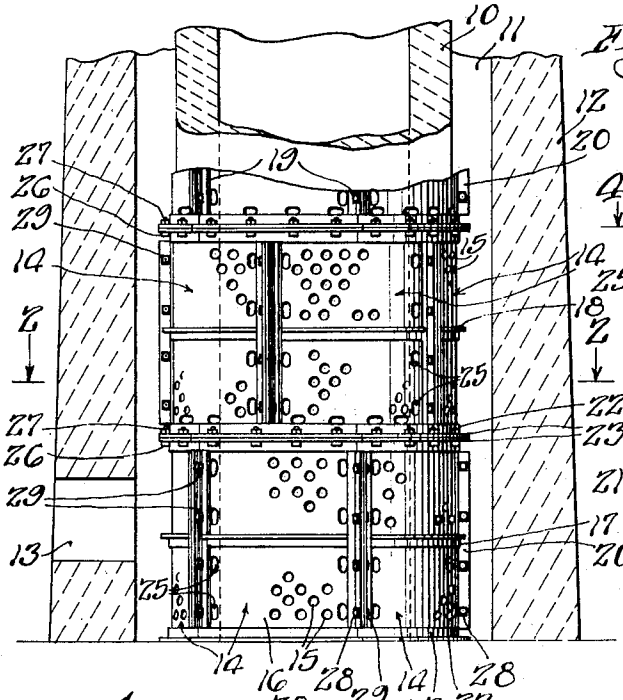


Fig. 3

Fig. 2

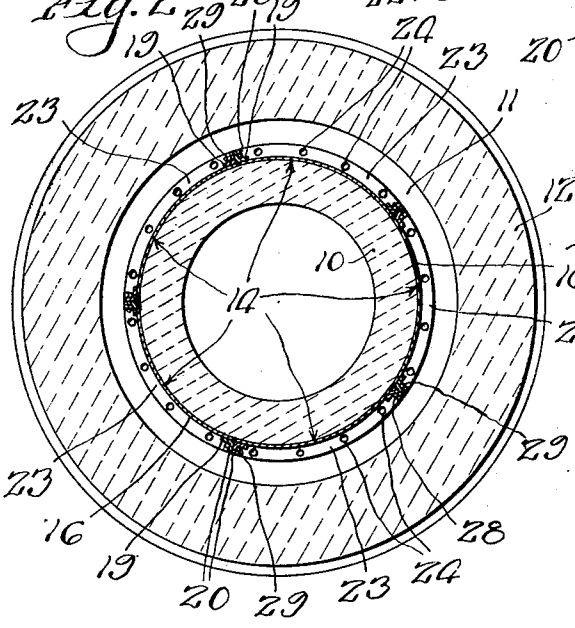


Fig. 4

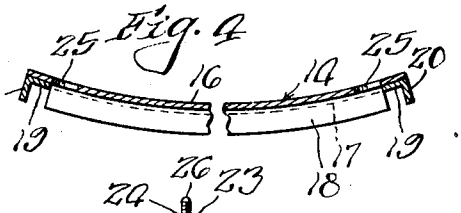
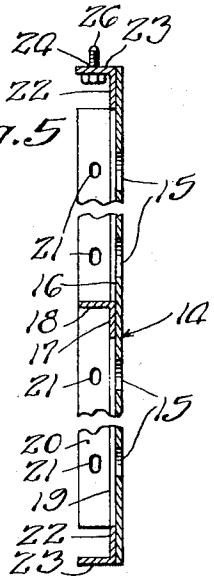


Fig. 5



Martin J. Conroy
INVENTOR;

BY Victor J. Evans
HIS ATTORNEY.

Patented Aug. 8, 1933 1,921,346

UNITED STATES PATENT OFFICE

1,921,346

PERFORATED RETAINER PLATE CONSTRUCTION FOR FIRE BRICK WALLS

Martin J. Conroy, Chicago, Ill.

Application October 10, 1930. Serial No. 487,821

1 Claim. (Cl. 72—101)

This invention relates to certain novel improvements in a perforated retainer plate construction for fire brick walls, and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

The salient object of this invention is the provision of an improved construction for preserving intact the refractory wall of a chimney, furnace, boiler or the like and more particularly to provide a retainer plate construction for preventing the fire brick wall of a furnace, chimney, boiler or the like from disintegrating due to the expansion and contraction of the fire brick caused by temperature changes therein.

Another object of the invention is the provision of an improved perforated retainer plate construction which is adapted to be mounted on the outer side of a fire brick wall so that heat may radiate from the fire brick wall through the perforated retainer plates into the air space provided between the retainer plates and the common brick wall disposed outwardly therefrom.

A further object of the invention, ancillary to the foregoing objects, is the provision of an improved perforated retainer plate construction which is so arranged that the heat imparted to the fire brick wall may radiate therethrough into the air space between the fire brick wall and the common brick wall so as to facilitate cooling of the fire brick wall and thereby to minimize the crumbling, disintegrating effect of temperature changes on the fire brick.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawing, showing the preferred form of construction and in which:

Fig. 1 is a sectional view through a typical chimney construction depicting a preferred form of construction of the invention in side elevation and in assembled position;

Fig. 2 is a sectional view taken substantially on the line 2—2 in Fig. 1;

Fig. 3 is a side elevational view of a section of the invention as depicted in Figs. 1 and 2;

Fig. 4 is a sectional view taken substantially on the line 4—4 in Fig. 3; and

Fig. 5 is a sectional view taken substantially on the line 5—5 in Fig. 3.

Referring to the drawing wherein a preferred form of construction of the invention is depicted, indicated at 10 is a fire brick wall and spaced from the wall 10 so as to define an air chamber 11 therebetween is a wall 12 which is customarily made of so-called common brick. To facilitate draft into and through the air space 11 a vent such as 13 is provided in the outer wall 12. The above described chimney structure forms no part of my invention and accordingly may be of any approved construction and shape so as to define an air cooling chamber between the two walls, it being understood that the purpose of the air chamber 11 is to facilitate cooling the fire brick wall 10. It will likewise be understood that while in the description to follow the present invention is described as adapted for use with a chimney structure such as is illustrated in Figs. 1 and 2, the invention is also adapted for use with shafts of all characters, as well as for the fire brick walls of boilers, furnaces, incinerators and the like.

The present invention includes a plurality of steel plates generically indicated at 14 and in each of these plates is provided a plurality of perforations 15. As shown in Fig. 3, each of the plates 14 includes a main body portion 16 across which extends a reenforcing strip 17, integral with which reenforcing strip is an outstanding flange 18. The reenforcing strip 17 is integral at both ends thereof with substantially L-shaped side strips 19 which include outstanding flanges 20, it being apparent that these side strips 19 may be formed integral with the body portion 16 of the plate or secured thereto in any suitable manner such as by welding. There is provided in each of the flanges 20 a plurality of spaced apart aligned holes 21 for a reason to be made apparent presently.

Provided at the top and bottom of each of the plates 14 and secured thereto in any approved manner is a substantially L-shaped member 22 which includes an outstanding flange 23. A plurality of spaced apart aligned openings 24 are provided in the flange 23. Provided in the body portion 16 of each of the plates 14 in alignment with and adjacent the openings 21 are openings 25, hereinafter to be called "hand holes", and the purpose of which will now be explained.

In assembling the plates 14 the flanges 23 are arranged in abutting relation so as to align the holes 24 and suitable connecting elements such as the bolts 26 are inserted through corresponding holes 24 and suitable nuts 27 secured thereon. The flanges 20 are likewise arranged in abutting relation so as to align the openings 21 through which suitable bolts 28 are inserted so as to receive nuts 29, it being apparent that in order to tighten the bolts 28 and nuts 29 the workman's

hands and a suitable tool may be extended through the hand holes 25, it being understood that the fire brick wall 10 is built up from inside the plates 10 after the plates 10 have been assembled in position.

As is well understood in the art, the fire brick wall 10 is most subject to disintegration, due to the expansion and contraction caused by temperature variations, in the bottom section of the wall where the hot furnace gases encounter the fire brick and the plates 14 are therefore particularly useful in the lower portion of the wall 10.

The plates 14, as shown in Fig. 1, are preferably arranged in staggered relation so that the vertically extending joints between the plates are out of alignment so as to minimize the possibility of the retainer plate wall spreading along the vertically extending joints between the plates.

It will be apparent, therefore, that the heat imparted to the fire brick wall 10 will radiate through the plates 14, which radiation is facilitated by the perforations 15, into the air space 11 which the perforations 15 likewise enable the air in the space 11 to contact directly with the fire brick wall 10, and this arrangement provides for cooling the fire brick wall and thereby to preserve the same and prolong its life.

From the foregoing description of the invention it will be apparent that I have provided an improved construction for preventing disintegration of fire brick walls due to temperature changes and consequent expansion and contraction of the fire bricks, and it will be seen that the present invention provides a construction which is economical in both manufacture and installation.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification, without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claim.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

The combination with a shaft including an outer wall and an inner wall, with an air space between them, of means for preserving the inner wall and comprising a plurality of plates to contact the same, each plate including a body having heat outlet perforations therein, a reinforced flanged strip secured to the body and across the same, substantially L-shaped strips secured to the side edges of the body and the first mentioned strip respectively, and including outstanding flanges provided with openings, substantially L-shaped members secured to the upper and lower edges of the body and including outstanding flanges provided with openings and means for securing the plates together one above the other and in edge to edge relation and including means passing through the openings in the cooperating flanges of the L-shaped strips and the cooperating flanges of the L-shaped members, and said plates having hand openings to facilitate the application of the securing means to the flanges of the L-shaped members.

MARTIN J. CONROY.