July 8, 1924.

1,500,504

G. F. LENK

THIMBLE

Filed Sept. 29, 1923

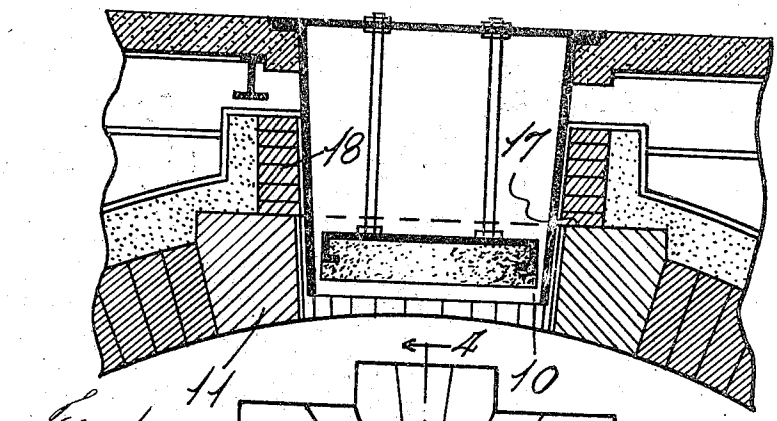


Fig. 1.

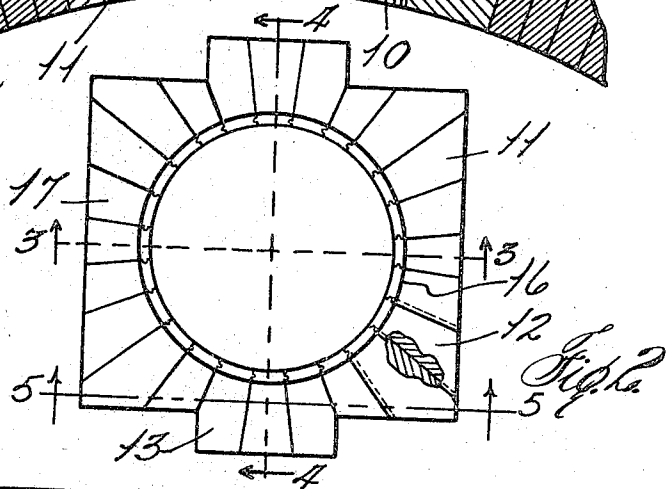


Fig. 2.

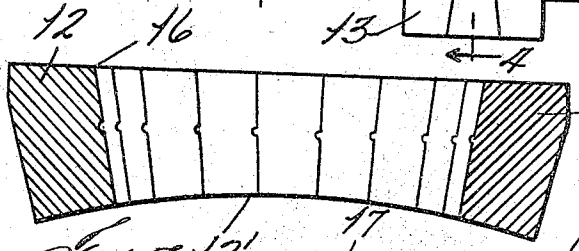


Fig. 3.

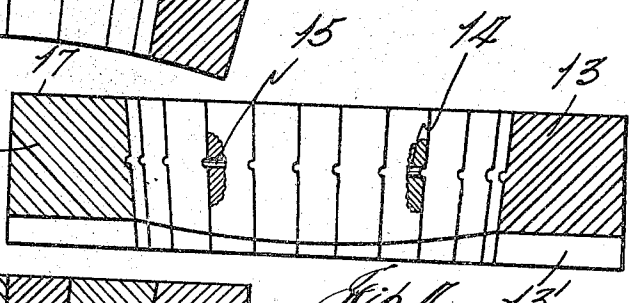


Fig. 4.

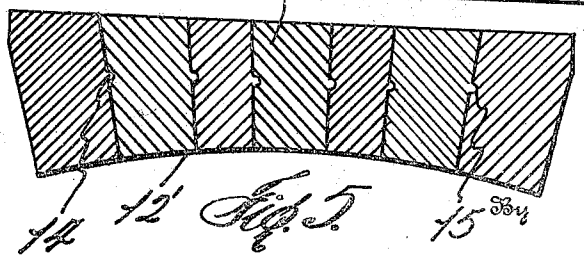


Fig. 5.

Inventor

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UNITED STATES PATENT OFFICE.

GUS F. LENK, OF DALLAS, TEXAS.

THIMBLE.

Application filed September 29, 1923. Serial No. 665,615.

To all whom it may concern:

Be it known that I, GUS F. LENK, a citizen of the United States of America, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Thimbles, of which the following is a specification.

This invention relates to new and useful improvements in thimbles for furnace charging holes.

In furnaces, such as incinerators, which are charged from the top, a hole is made in the roof of the combustion chamber and a hopper lining used in this hole. The heat around the lower end of the hole is intense and it is necessary to use fire resisting material, such as fire clay in forming the roof of the combustion chamber. This roof has its under side curved longitudinally and transversely and therefore a thimble at the lower end of the hole set into the roof has proved the most practical construction.

Such thimbles have been made and used, but certain defects are present in those now in use. Where the sections or blocks forming the thimble are large it is difficult to thoroughly burn the same through and through, in the curing process and such blocks crumble and disintegrate in use. Further the thimble is subjected to a heavy downward pressure as well as extreme expansion and contraction and sections unless adequately held will fall out and wreck the thimble.

The object of my invention is to provide a thimble formed of a plurality of radial blocks or sections of fire clay or equivalent material arranged to interfit with the bricks or blocks of which the roof is built.

A particular object of the invention is to provide said blocks with interlocking projections and sockets or seats therefor, whereby the sections of the thimble can not become displaced under a load, sag or separate.

A further object is to provide sections having their sides radiating from two centers substantially at right angles to each other, whereby the central opening is formed and the sections are sustained against downward pressure.

Another object is to form the thimble of a plurality of interlocking blocks of such size that each may be thoroughly burned in the kiln so as to "stand up" in the combustion chamber.

A still further object is to provide ample clearance between the lower end of the charging hopper and the opening of the thimble to compensate expansion and contraction of the component parts and preventing distortion of the combustion chamber arch due to contact between the thimble and hopper.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Fig. 1 is a sectional view of a portion of the combustion chamber roof and the charging hole, together with a thimble constructed in accordance with my invention,

Fig. 2 is a plan view of a thimble embracing the invention,

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 2,

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 2, and

Fig. 5 is a cross-sectional view taken in line 5—5 of Fig. 2.

In the drawings the numeral 10 designates a charging hole hopper in the roof of a furnace combustion chamber. Surrounding the lower end of the hopper and built into the roof is a thimble 11.

The thimble is composed of a plurality of radial sections or blocks 12 and 13 respectively formed of fire clay or other suitable material. Each block has a tongue 14 along one side and a groove 15 along the other side, but may have any other male and female interlocking means. The inner face 16 of each block is curved so that the central opening will be formed when the blocks are assembled.

The blocks are small enough to be thoroughly burned in the kiln. The blocks 12 are formed to give a substantially square thimble when assembled; while the key-block 13 on each side provide lugs projecting beyond the square on each side. The tongues and grooves on the blocks 12 extend from the faces 16 to the outer edges thereof and this is true of the contacting sides of the blocks 13. However the exposed sides of the blocks 13 forming the lugs do not require tongues and grooves and from these, they may be omitted.

The upper faces 17 of the blocks are flat

and are all assembled in the same horizontal plane. The under faces 12′ and 13′, respectively, are curved to conform to the right angled curvatures of the roof of the combustion chamber so that the under surface of said thimble will conform exactly thereto. The thimble is built into the roof and the lugs provide shoulders against which the fire bricks 18 of the roof may be set to form proper joints and a continuous surface.

It will be seen that the blocks are not only radial on a horizontal direction, but also in a vertical direction, their sides extending radially from a point below the thimble when it is placed in the roof. This feature coupled with the tongues and grooves makes a structure which resists all downward pressure and which remains intact under all the trying conditions to which it may be subjected. It will be seen that each block is shaped to co-operate with the others and to sustain its particular load.

The thimble surrounding the lower end of the hopper 10 will protect the same and will also reinforce the lower end of the charging hole. The blocks will not break loose, crack, sag or separate and an efficient and lasting structure will be produced.

An important advantage of the invention is the clearance provided between the lower end of the hopper 10 and the central opening of the thimble. It is obvious that if these parts were to contact, the hopper would be displaced upward or the thimble would be wedged around the hopper, under extreme expansion, whereby the thimble and arch would be injured. By providing this clearance the thimble and arch may rise and fall without contacting with the hopper or disintegrating.

What I claim, is:

1. A furnace charging hole thimble comprising a plurality of blocks surrounding a central opening and having their contacting sides flared outwardly and radiating upwardly, whereby the blocks are assembled to resist a downward pressure.

2. A furnace charging hole thimble including a plurality of blocks surrounding a central charging opening and flaring outwardly, and male and female interlocking projections on the contacting sides of the blocks, for supporting the blocks against vertical displacement.

3. A furnace charging hole thimble including a plurality of blocks surrounding a central opening and flaring outwardly, and male and female interlocking projections on the contacting sides of the blocks, said blocks also having their contacting sides radiating upwardly.

4. A furnace charging hole thimble including a plurality of blocks surrounding a central opening and flaring outwardly, and radially extending tongue and groove joints between the contacting sides of the blocks, the under surfaces of the blocks being curved to conform to the curvatures of the roof of a combustion chamber.

5. A furnace charging hole thimble including a plurality of blocks surrounding a central opening and flaring outwardly, and tongue and groove joints between the contacting sides of the blocks, the under surfaces of the blocks being curved to conform to the curvatures of the roof of a combustion chamber, the blocks having their contacting faces radiating upwardly.

6. In a furnace structure, the combination with the roof of a combustion chamber having a charging hole therein, and a metal hopper depending in said hole, of a thimble composed of radiating interlocking blocks surrounding the lower end of the hopper and set into the roof there being ample clearance between the hopper and the thimble to constitute an expansion joint.

In testimony whereof I affix my signature.

GUS F. LENK.