Mar. 27, 1923. 1,449,795.

J. THORNTON.

PROTECTION FOR CHARGING PORT THROUGH FURNACE WALLS.

FILED JUNE 13, 1922.

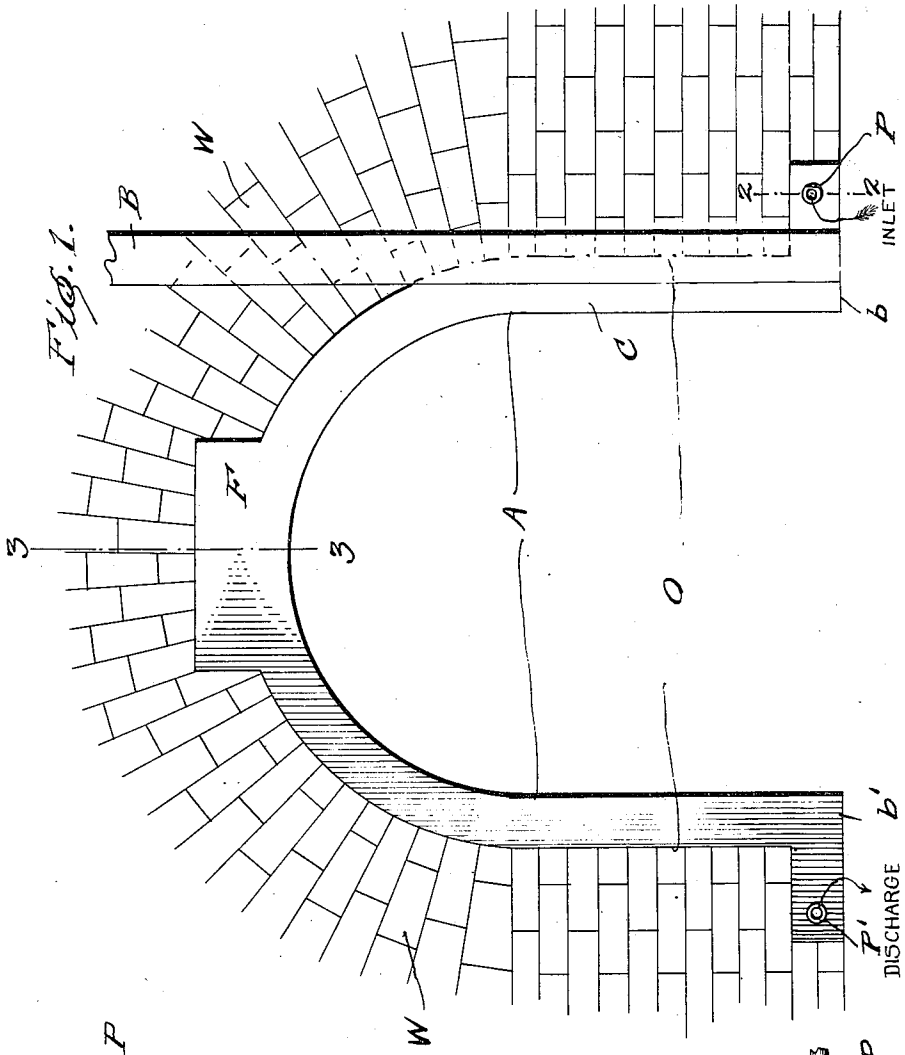


Fig. 1.

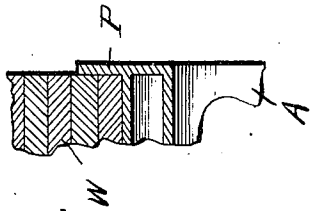


Fig. 3.

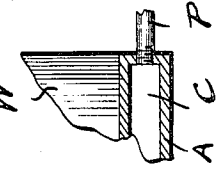


Fig. 2.

Inventor

John Thornton

By W. C. Carman

Attorney

Patented Mar. 27, 1923. 1,449,795

UNITED STATES PATENT OFFICE.

JOHN THORNTON, OF YOUNGSTOWN, OHIO.

PROTECTION FOR CHARGING PORT THROUGH FURNACE WALLS.

Application filed June 13, 1922. Serial No. 567,879.

To all whom it may concern:

Be it known that I, JOHN THORNTON, citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Protection for Charging Port Through Furnace Walls, of which the following is a specification.

My invention relates to furnace construction, and more particularly to that part of the furnace adjacent the charging port,—the primary object and purpose being to provide efficient protection to the brick-work of the wall around the opening through which the furnace is charged. In ordinary construction of furnace walls, this brick-work is left absolutely exposed to disturbance and damage by the charging apparatus as it is forced into, and drawn from, the furnace.

Another object of my invention is to provide external, extrinsic means for cooling certain types of furnace doors, as well as buck-stays adjacent thereto.

The invention, as described in Patent No. 1,407,708, issued to me under date of February 28, 1922, is designed for substantially the same purpose, but pertains to the construction of furnace door-frames of hollow formation provided integrally with an inwardly extending flange or protecting element designed for protection of the brick-work of the wall around the opening, the same as above suggested with reference to the present invention.

At times, however, what are known as "dry door-frames" are used. In other words, frames not provided with water circulating chambers for the purpose of cooling the same, and it would, of course, be impossible to provide such frames with the protecting element shown in the above specified patent, and it is in connection with these so-called dry door-frames that my present invention is designed for use.

Furthermore, the buck-stays adjacent the charging port of the furnace are subject to exceptionally extreme heat because of their location, causing them to buckle and give way more frequently than buck-stays at other portions of the furnace, and my device will aid very materially in keeping these buck-stays cool, thereby correspondingly increasing the length of service of the same.

In the drawings Figure 1 is a front elevation of my invention; Figure 2 is a vertical sectional view on line 2—2, Figure 1, and Figure 3 is a similar view on line 3—3 Figure 1.

Similar reference characters designate corresponding parts of the device throughout the various figures of the drawings.

Primarily, my invention consists of a metal frame of hollow construction or formation to be inserted within the opening in the furnace wall, and registering in a horizontal plane with the charging port through the door-frame.

A represents the body of my construction, of oval formation as shown in the drawing, and provided at the bottom with the oppositely disposed, outwardly extending flanges or foot members b and b', formed integrally with the body of the frame, all being of continuous hollow formation and providing the water circulating chamber c, as hereinbefore suggested.

F represents an upstanding flange or plate designed to rest against the outer face of the furnace wall W, for the purpose of supporting the frame and holding it firmly in position.

P represents the intake water pipe through which the water is introduced into the framework, which after circulating through the water chamber c, is discharged through the outlet pipe P'.

B represents a buck-stay or external vertical support for the furnace wall, and, as is well known in furnace operation, great difficulty is experienced in preventing these buck-stays from becoming over-heated, causing them to buckle, and seriously interfering with their efficiency, and this difficulty is much greater with reference to the buck-stays adjacent the charging port than at other points of the furnace wall. By permitting the buck-stay to partially over-lap the water circulating chamber of my construction, as shown in the drawing, the heat radiation from the furnace to these buck-stays will be very substantially deterred and reduced, with the result that the buck-stay will retain its supporting position much longer.

While I have shown a buck-stay upon one side only of the opening in the wall, in actual construction a similar buck-stay will be placed upon the other side of the opening, and an ordinary dry door-frame secured between the two buck-stays. As suggested above, this frame is designed to be inserted

in the opening O in the furnace wall for the purpose of protecting it from damage by the charging apparatus as it passes in and out of the furnace, and also for cooling the door-frame and the buck-stays.

I claim:

A construction of the character described, consisting of a metal frame-work of hollow construction having an upright portion, and oppositely disposed foot members, one of said foot members communicating with an inlet pipe, and the other with a discharge pipe, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOHN THORNTON.

Witnesses:

LEILA C. AUGUSTINE,

ALICE MCGINN.