Feb. 26, 1946. T. J. PETERS 2,395,757

WATER COOLED FURNACE DOOR

Filed May 20, 1943

Fig. 1.

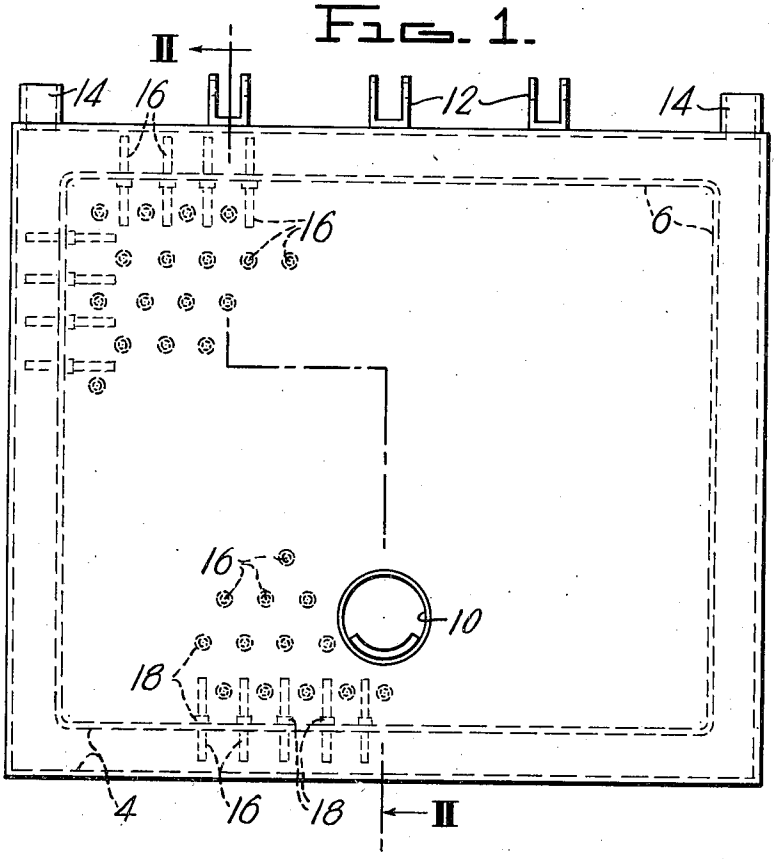


Fig. 2.

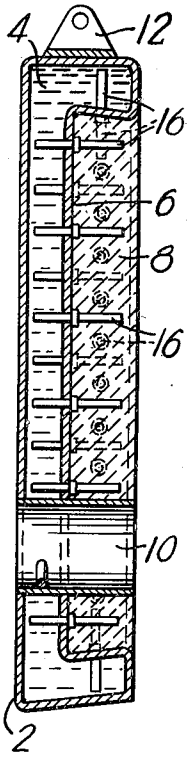
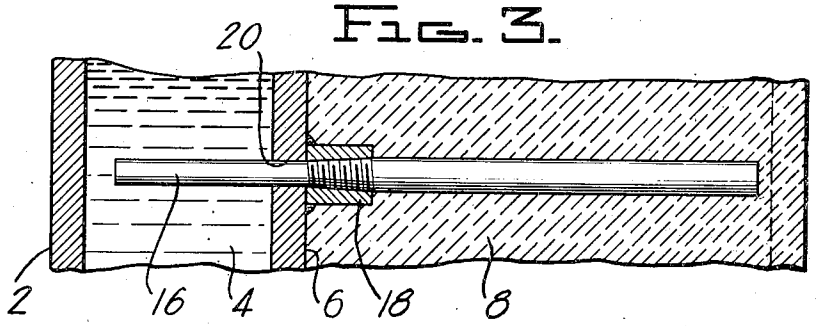


Fig. 3.



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WATER-COOLED FURNACE DOOR

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Application May 20, 1943, Serial No. 487,779

1 Claim. (Cl. 122—498)

This invention relates to a water cooled door for use on open hearth furnaces and high temperature heating furnaces. The inside of these doors must be lined with a refractory to withstand the high temperatures in the furnace. To prevent the door from becoming overheated the remaining portion of the door is water cooled. Heretofore, such doors had steel studs welded to the door plate or screwed into nuts welded to the door plate for reinforcing the refractory lining. The heat from the refractory lining was not conducted into the cooling chamber with the result that the lining would spall and disintegrate, thus requiring frequent repair of the door.

It is an object of this invention to provide a water cooled door having means for conducting the heat from the refractory into the cooling chamber.

This and other objects will be more apparent after referring to the following specification and attached drawing, in which:

Figure 1 is an elevation of the door;

Figure 2 is a cross-sectional view taken on line II—II of Figure 1; and

Figure 3 is an enlarged detail of the stud.

Referring more particularly to the drawing, the reference numeral 2 indicates the door plate which is bent to provide a water chamber 4 and an open chamber 6 in that portion of the door facing the furnace. The chamber 6 is filled with a plastic refractory lining 8. A peep-hole 10 extends through the door to enable the operator to view the conditions within the furnace. Fastened to the top of the door plate 2 is a plurality of brackets 12 to which means for supporting the door are attached. Welded to the top of the door are two pipe couplings or nipples 14 which communicate with the water chamber 4. The cooling water enters through one of these couplings 14, circulates through the chamber 4 and passes out through the other coupling. The construction of the door described above is conventional.

The invention lies in the provision of studs which extend from the chamber 6 into the water chamber 4, the studs being made of a material having a high coefficient of thermal conductivity. In practice, commercially pure copper studs have been used with great success. The studs 16 are installed as follows:

A plurality of pipe couplings 18 are welded to the door plate over holes 20 formed therein. The studs 16 are screwed into the couplings 18 and extend through the holes 20 into the water chamber 4. The tapered pipe threads give a sealing effect, thus preventing leakage of water into the refractory lining. The copper studs reinforce the plastic lining and also conduct the heat from the plastic lining into the cooling water. This results in a greatly increased lining life which gives a much longer furnace door life while requiring infrequent repairs.

While one embodiment of the invention has been shown and described, it will be understood that other modifications may be made without departing from the scope of the attached claim.

I claim:

A water cooled furnace door comprising a refractory lining in that portion of the door facing the furnace, a water chamber adjacent said refractory lining and a plurality of closely spaced copper studs embedded in said refractory lining, said studs extending to within a short distance of the outer face of said refractory lining and substantially through the water chamber whereby the heat is conducted from said refractory to the water in said chamber.

TOM J. PETERS.