

G. DE GRAHL.
FIRE DOOR FOR BOILER FURNACES.
APPLICATION FILED APR. 23, 1910.

980,773.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

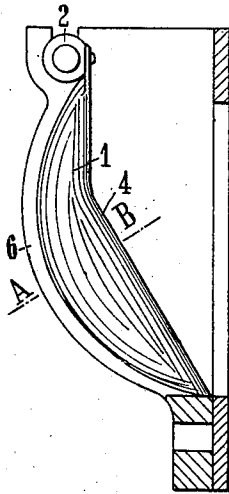


Fig. 2.

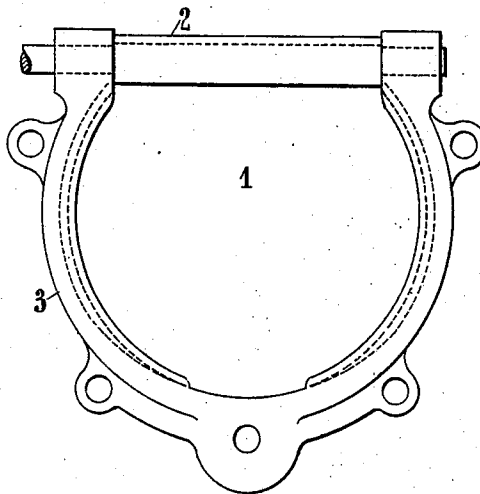
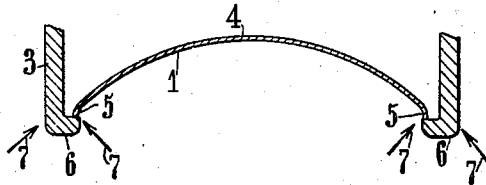


Fig. 3.



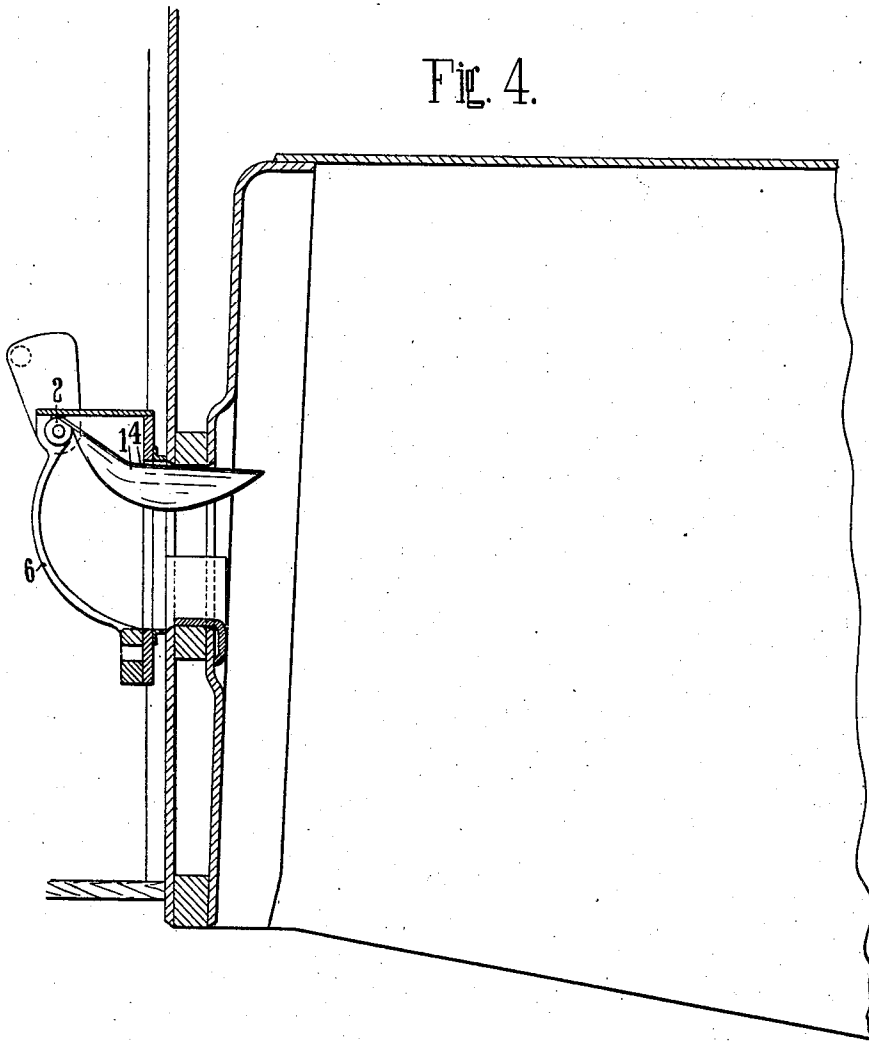
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GUSTAV DE GRAHL, OF ZEHLENDORF, NEAR BERLIN, GERMANY.

FIRE-DOOR FOR BOILER-FURNACES.

980,773.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed April 23, 1910. Serial No. 557,245.

To all whom it may concern:

Be it known that I, GUSTAV DE GRAHL, a subject of the German Emperor, and residing at Zehlendorf, near Berlin, Germany, have invented certain new and useful Improvements in Fire-Doors for Boiler-Furnaces, of which the following is a specification.

My invention relates to boiler furnaces, and a primary object is to provide therefor an improved fire door formed as a swing door.

Inwardly-opening fire doors formed as swing doors for boiler furnaces are well-known, the fire door being seated against the water-cooled wall of the boiler surrounding the fire hole. These arrangements have the disadvantage, however, that the seat is not sufficiently removed from the full glow of the furnace and therefore the rivet heads on the inside of the boiler wall facing the furnace burn away in time and cause leaks. A further disadvantage of these known arrangements consists in the open fire door projecting far into the furnace, whereby the destruction of the fire door by the full glow of the furnace is aided.

According to my invention I successfully overcome the above described disadvantages by making the fire door saddle-shaped and placing the seat against which the fire door rests, so far toward the outside away from the furnace that it is not only removed for the most part from the action of the full glow of the furnace, but also is effectively cooled by the air surrounding it and projects in its open position only a little into the furnace.

One illustrative embodiment of my invention is represented by way of example in the accompanying drawing, wherein:—

Figure 1 is a side elevation, the door frame being shown in section, while Fig. 2 is a front elevation, and Fig. 3 a section on the line A—B in Fig. 1. Fig. 4 shows the fire door in side elevation on a smaller scale in connection with a furnace, the door frame and the furnace being shown in section.

Referring to the drawing, 1 designates the fire door formed as a swing door rigidly connected with the shaft 2 journaled in the door frame 3. The pivotally-mounted fire

door is arched at 4 (Fig. 3) toward the furnace and when closed rests with its edges 5 on the ribs 6 of the door frame. The door frame is preferably formed as a protective ring for the rivets, by which the two walls of the fire box are connected in well-known manner with the ring located between them.

As seen from the drawing, the fire door itself is saddle-shaped, *i. e.* it is concave as seen in section on the line A—B in Fig. 1 from the stoke-hole or cab (Fig. 3) and convex in longitudinal section, so that it is prevented from warping.

Owing to the above described arrangement, as mentioned above the seats 5, 6 are removed from the action of the full glow of the furnace and effectively cooled by the air surrounding them. The cooling air acts in the direction of the arrows 7 on the seats and takes up a portion of the heat supplied to the seats. As the open fire door projects only slightly into the furnace, it is for the most part removed in this from the heat of the furnace, so that the fire door does not require to be exchanged within a measurable time.

The fire door can be held open by well-known means, for example by a counterweight, provided on the shaft 2.

I claim:—

The combination with a boiler furnace, of a door frame having a fire hole, and an inwardly opening fire door pivotally mounted on the upper portion of the door frame and normally seated against the door frame, said fire door in normal position being arched inwardly about an inclined axis and being sharply bent inwardly in its upper part about a transverse axis, said door frame being provided at the front with inwardly directed flanges forming the seat of the fire door, said seat being disposed so far from the furnace, that it is removed from the action of the full glow of the furnace and is effectively cooled by the air surrounding it.

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

GUSTAV DE GRAHL.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.