

(No Model.)

H. McDONALD.  
Furnace-Shield.

No. 228,548.

Patented June 8, 1880.

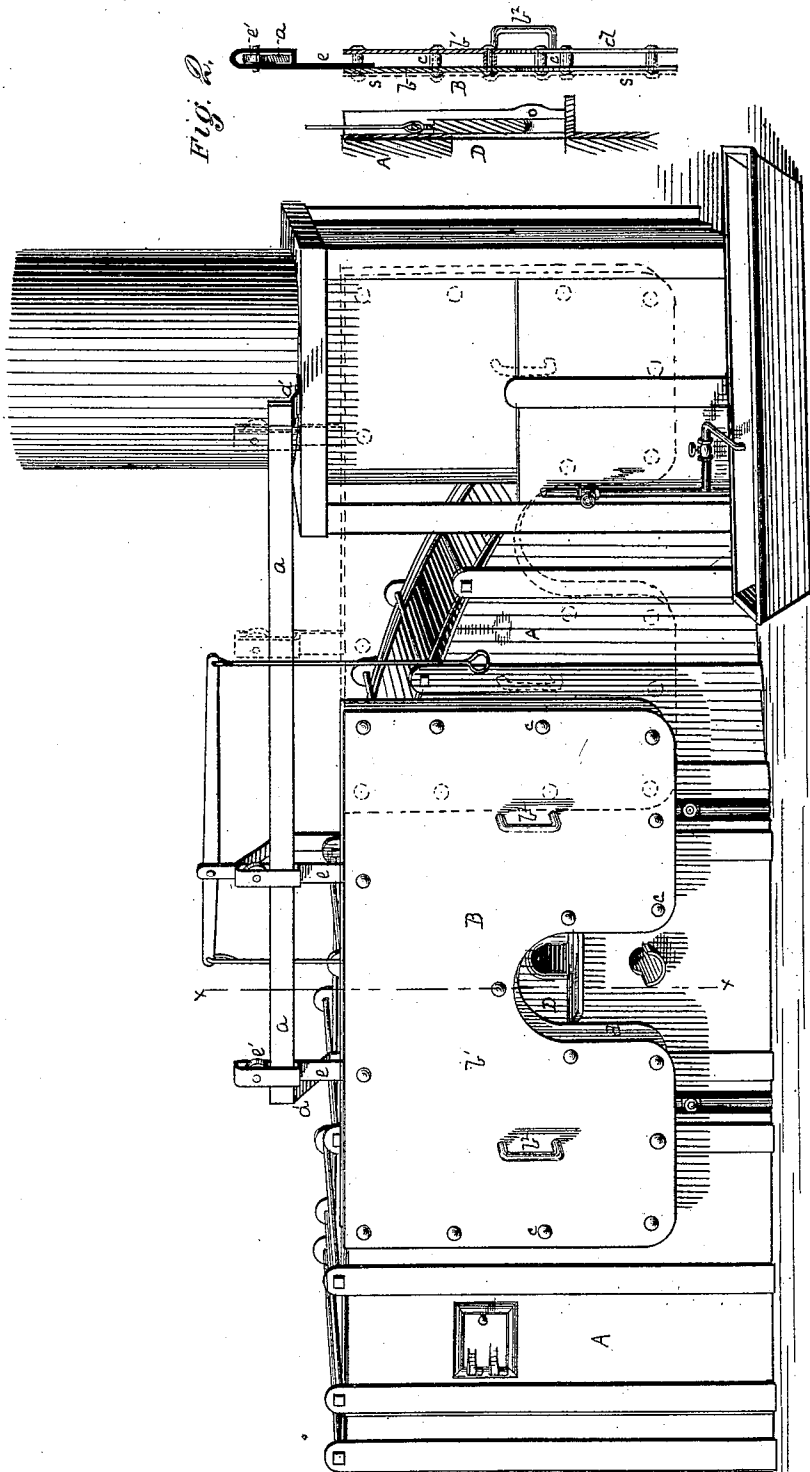


Fig. 2.

Fig. 1.

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# UNITED STATES PATENT OFFICE.

HUGH McDONALD, OF ALLEGHENY, PENNSYLVANIA.

## FURNACE-SHIELD.

SPECIFICATION forming part of Letters Patent No. 228,548, dated June 8, 1880.

Application filed April 2, 1880. (No model.)

To all whom it may concern:

Be it known that I, HUGH McDONALD, of Allegheny, county of Allegheny, State of Pennsylvania, have invented or discovered  
5 a new and useful Improvement in Furnace-Shields; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of  
10 this specification, in which—like letters indicating like parts—

Figure 1 is a side elevation, slightly in perspective, of a puddling or boiling furnace, showing my improved furnace-shield applied  
15 thereto; and Fig. 2 is a sectional view of the shield in the line  $xx$  and through the door and adjacent wall of the furnace, and illustrative of the relation of the two when in use.

Various forms of constructions of furnace-shields have been devised by which to protect the workman from the excessive heat generated in metallurgic operations. The present improvement in furnace-shields is designed for that end, and it differs from other  
20 shields heretofore known chiefly in the fact that I combine with the ordinary iron shield plate or frame a second metallic plate having a comparatively low conducting or radiating power, whereby the injurious or objectionable  
25 radiation of heat is effectually prevented and the workman properly protected.

A may represent a puddling or boiling or other furnace for metallurgic purposes, in which an excessive heat is required.

35 Opposite the door D, and at a little distance therefrom, as shown in Fig. 2, so as to leave room for the circulation of air, I arrange my improved shield B, which is made up of the usual back or frame plate  $b$ , usually of wrought-iron, and secured thereto in  
40 any convenient way, as by rivets and distance-pieces  $c$ , an exterior plate,  $b'$ , having the same general contour, but made of zinc or other metal having a comparatively low  
45 power as an absorbent, conductor, or radiator of heat.

The exterior plate,  $b'$ , may be placed directly against the plate  $b$ ; but I prefer to separate them a short distance, so that air  
50 may circulate freely between the two, and thereby lessen materially what little tendency the exterior plate may have for absorbing heat radiated from the other plate.

The shield thus constructed is made, by  
55 preference, large enough to cover about so

much of the furnace-wall as comes opposite to the position usually occupied by the workman in doing his work, and for puddling-furnace use is recessed, as at  $d$ , so as to uncover the stopper-hole of the furnace.

Any suitable means of holding the shield in the proper position for use and removing it out of the way when its presence is not desired may be employed; but preferably I hang it, by straps  $e$  and friction-rollers  $e'$ , on  
60 a raised track-rail,  $a$ , which is supported by brackets  $a'$ , and in such manner that the shield may be moved laterally out of the way, when desired, to about the position shown by dotted lines, and for this purpose handles  $b^2$   
65 are provided.

If further protection is desired, an additional sheet of zinc or other suitable material, as above stated, may be arranged on the back side of the plate  $b$ , and be either bolted  
70 close to the plate, as at  $s$ , or adjusted at a little distance therefrom, as with  $b'$ ; or, the plate  $b'$  being omitted, such plate  $s$  on the back side of plate  $b$  may be used as a substitute therefor in the combination described;  
80 but for most purposes it is believed that one non-conducting plate is enough, and that the best place for it is on the front side of the plate  $b$  and at a little distance therefrom.

The plate  $b$ , of wrought or cast iron or  
85 steel, gives to the shield the necessary elements of strength and durability as against the rough usage commonly met with from iron-workers, and the non-conducting or low-conducting plate  $b'$  is held and carried there-  
90 by, so as to act as a protection to the workman when necessarily exposed in doing his work.

Other useful elements of furnace-shield construction, as the same may be known in the  
95 art, may be added to the construction described, as the manufacturer or user may desire.

I claim herein as my invention—

In the construction of furnace-shields, the  
100 combination, with the body of the shield, of one or more plates of zinc or other low or poor-conducting metal, substantially as set forth.

In testimony whereof I have hereunto set  
105 my hand.

HUGH McDONALD.

Witnesses:

R. H. WHITTLESEY,  
C. L. PARKER.