(No Model.)

H. McDONALD.

Furnace-Shield.

No. 228,549. **Patented June 8, 1880.**

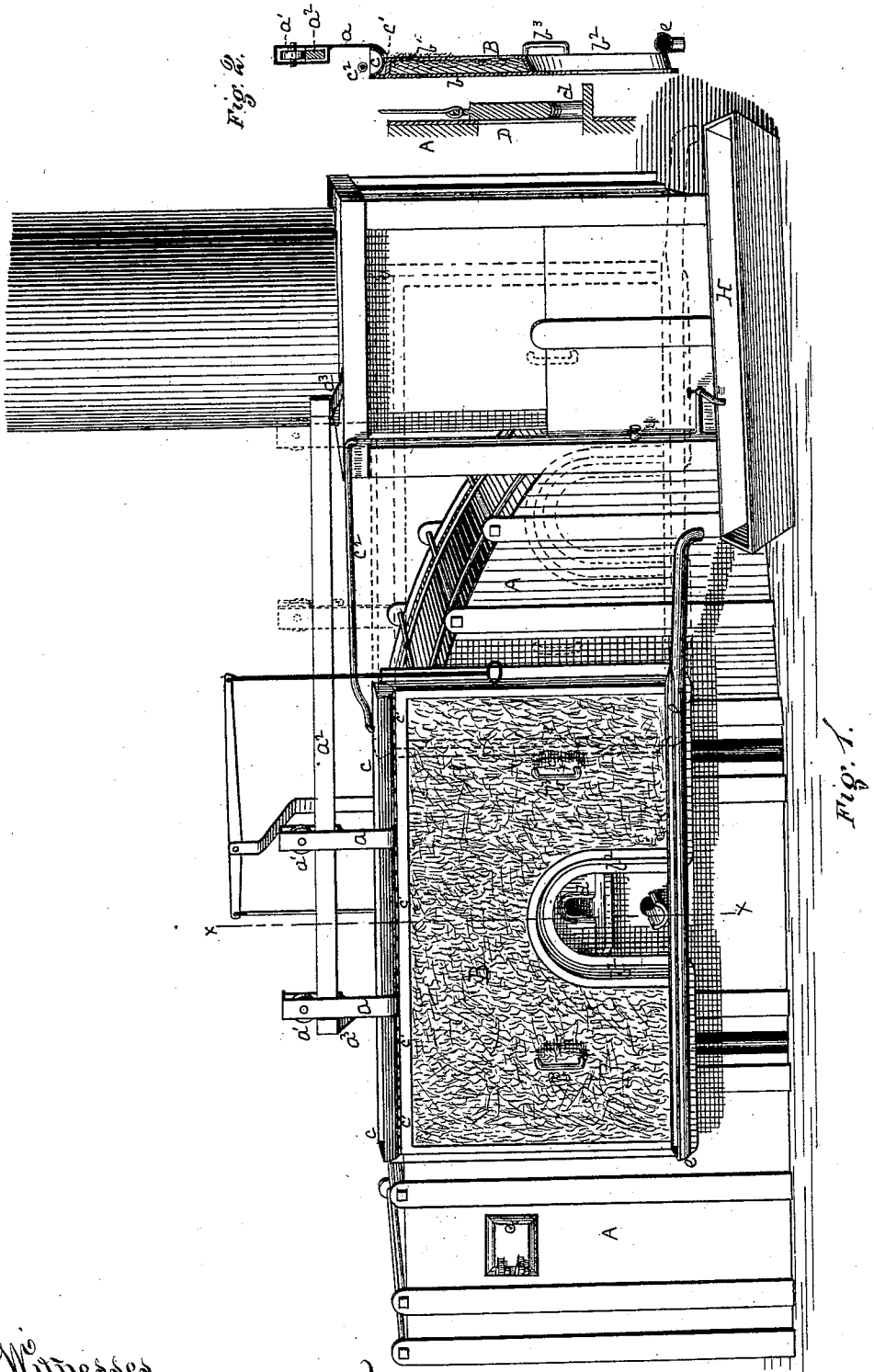


Fig. 2.

Fig. 1.

Witnesses
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HUGH McDONALD, OF ALLEGHENY, PENNSYLVANIA.

FURNACE-SHIELD.

SPECIFICATION forming part of Letters Patent No. 228,549, 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 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 this specification, in which—like letters indicating like parts—

Figure 1 is a side elevation, slightly in perspective, of an ordinary puddling or boiling furnace with my improved shield applied thereto; and Fig. 2 is a sectional view through the shield and adjacent furnace-wall in the plane of the line *x x*, Fig. 1.

The excessive heat to which the workman is necessarily subjected in many metallurgic operations, and more particularly in the puddling or boiling of iron, is so oppressive that different constructions of shields have been devised, which, being arranged between the ordinary position of the workman and the furnace wall or door, give him a considerable degree of protection and enable him to do his work better, with better results, and much less discomfort or positive injury to himself.

As a protective agent, water is deemed by many to be the best, and in my present invention I provide for the use of water in connection with a fiber practically indestructible by heat, of which asbestus is the best now known to me; and while I have shown and will describe my invention with particular reference to its use in connection with a puddling or boiling furnace, I include herein its use with any and all furnaces or fire-chambers where protection to the workman is desired.

A represents a puddling or boiling furnace of the usual construction.

Opposite the door D, and between it and the position usually occupied by the workman, I arrange my improved shield B, which is composed of a metallic plate, *b*, and a layer or stratum or filling, *b'*, of fibrous material, such as will not be seriously affected by the heat radiated from the furnace, and the best material now known to me for such use is asbestus. This material, being somewhat fibrous in its structure, is to that extent a good absorbent of water; and in order to keep it wet or saturated with water while in use I arrange along the upper part of the shield a water pipe or trough, *c*, and in the bottom of it make a series of small jet-holes, *c'*, or an equivalent narrow slit, in such position that water supplied thereto will be discharged onto or into the fibrous part *b'* of the shield, and will slowly trickle or run down on or through the fiber, so as to keep it wet. The excess of water, if any, will be caught by the trough *c* and carried off to the bosh H.

Water may be supplied to the upper trough, *c*, by any suitable pipe, c^2, and the parts are, by preference, so proportioned and arranged that whether the shield be in position, as shown in full lines, Fig. 1, or run to one side, as shown in dotted lines, the trough *c* will be regularly supplied, and the excess will be discharged into the bosh. Hence the water-supply required in the bosh can be regularly and constantly kept up without material waste.

The shield should be arranged at a little distance from the furnace, so as to provide room for a free circulation of air between the two. It may be held in and guided to and from position in any suitable way—as, for example, by hangers *a a*, friction-rollers *a'*, and track-rail a^2, supported by brackets a^3. The usual recess b^2 is also to be made in the shield when intended for puddling-furnace use, in such position and of such shape that when in use it will come opposite the usual stopper or working-hole *d* and permit the free use of the tools.

The handles b^3 are for convenience in moving the shield.

A like layer of like fiber and a like water-supply may be arranged on the other side of the plate *b*, if so desired.

Instead of mineral fiber any suitable animal or vegetable fiber or fibrous substance may be employed.

While a continuous or constant water-supply is of great advantage in my present improvement, it still may be practicable to use the fibrous material referred to without such constant water-supply by throwing or dashing water on it at intervals as it becomes heated, particularly if the fiber be open, loose, or highly porous, since in such case the water will be

readily absorbed and a considerable portion retained until evaporated. Hence, that I may be adequately protected in my present invention, I do not limit myself to a structure in which water is constantly or even mechanically supplied, since water supplied by hand or in any way may enable the asbestus or other suitable fiber to be used to advantage for the purposes named.

I claim herein as my invention—

A furnace-shield having, in combination, a metal back or plate, *b*, and a fibrous face lining or filling, *b'*, on one or both sides thereof, either with or without a water-distributing mechanism for keeping such fibrous material wet or saturated, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HUGH McDONALD.

Witnesses:

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