

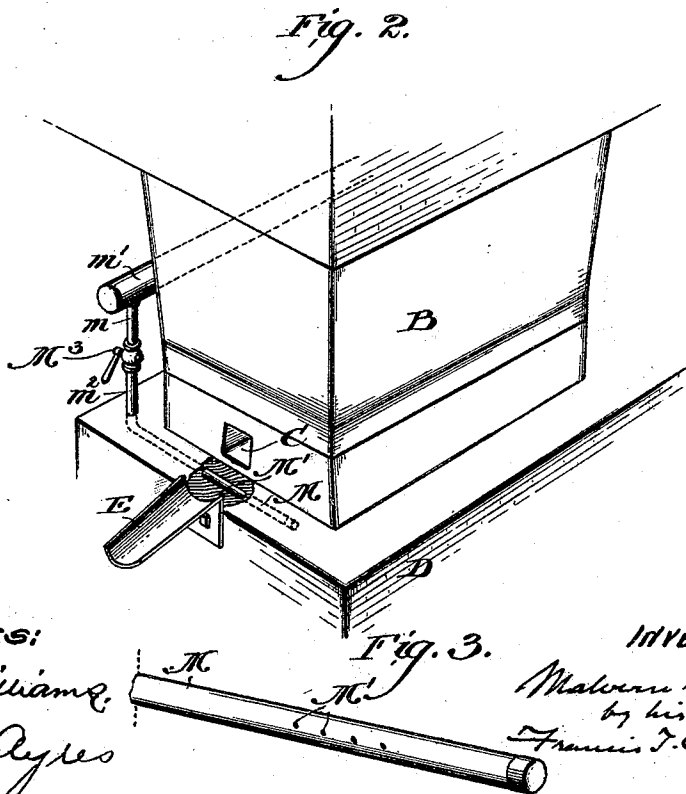
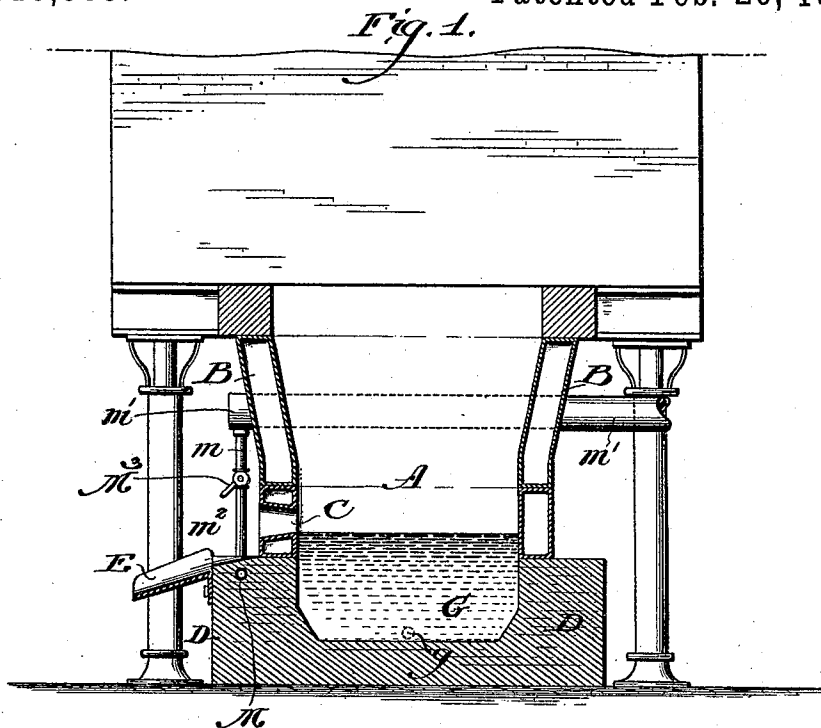
(No Model.)

M. W. ILES.

METHOD OF AND APPARATUS FOR COOLING FURNACE BREASTS.

No. 515,085.

Patented Feb. 20, 1894.



WITNESSES:

David Williams,
Edw. F. Ayres

INVENTOR:

Malvern W. Iles
by his atty.
Francis J. Chambers

UNITED STATES PATENT OFFICE.

MALVERN W. ILES, OF DENVER, COLORADO.

METHOD OF AND APPARATUS FOR COOLING FURNACE-BREASTS.

SPECIFICATION forming part of Letters Patent No. 515,085, dated February 20, 1894.

Application filed August 16, 1893. Serial No. 483,256. (No model.)

To all whom it may concern:

Be it known that I, MALVERN W. ILES, a citizen of the United States, residing at Denver, in the county of Arapahoe, in the State of Colorado, have invented certain new and useful Improvements in Methods of and Apparatus for Preventing the Leaking of Melted Metals through the Breasts of Furnaces, of which the following is a true description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the construction and operation of smelting furnaces, particularly, though not exclusively, to furnaces such as are used in the smelting of silver lead ore. Heretofore trouble has been met with owing to the leaking of the melted metal through the masonry breast of the furnace, such leaking being particularly apt to occur below that part of the breast over which the melted slag is run from the slag spout, which part is naturally heated to a higher point than the rest of the breast or crucible. Various plans have heretofore been tried for preventing the seeping of metal into the masonry, among which has been the insertion of a water cooled block of iron below and in front of the slag tap hole, while the most general plan has been at frequent intervals to throw water upon the outside of the masonry most exposed to the mischief referred to. This latter plan however is not only lacking in efficiency but also tends to wear away the masonry and destroy the furnace.

Now I have discovered that by injecting fine streams of water into the body of the masonry the seeping of the metal can be checked and at the same time without injury to the masonry, and while this method of protecting the furnace can be applied in any convenient way I have found in practice that by building a pipe into the masonry extending across, below and in front of the slag tap hole, forming a number of fine holes in the pipe and connecting it with a source of water supply, the mischief can be and effectually is counteracted.

Reference being now had to the drawings which illustrate my invention Figure 1 is a side elevation, partly in section, of a furnace provided with my improvement. Fig. 2 is a perspective view of the front of such a fur-

nace with part of the masonry removed to expose the pipe, and Fig. 3 a view on a larger scale of the end of the water pipe.

A indicates a silver lead furnace; B B, &c., the water jackets forming the lower part of the furnace; C the slag tap hole; D the masonry base or crucible of the furnace; E a slag spout; G the crucible containing the melted metal; *g* the orifice leading from the bottom of the crucible through which the metal is withdrawn; M, a pipe formed with a number of fine perforations M', as indicated in Fig. 3, and connecting, as by means of pipes or hose *m m*², with a source of water supply indicated at *m'*; M³ indicating a controlling cock by which the amount and force of the water entering the pipe M can be regulated.

The furnace is operated in the usual way, the slag being tapped from the opening C over the breast and into the spout E: it is the part of the breast over which the slag passes which is particularly exposed, owing to its higher heat, to the destructive action of seeping metal, therefore the perforated pipe M is placed immediately below and in front of the slag tap hole and a constant supply is permitted to flow into it from the receptacle *m'*, the cock M³ serving to regulate the quantity of water escaping into the masonry through the perforations M'.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of preventing the leaking of melted metal through the breasts of furnaces which consists in introducing a fine stream of water into the interior of the masonry breast of the furnace.

2. The combination in a furnace with a masonry breast, of a water pipe M embedded in the breast N and provided with small orifices M' for the escape of the water.

3. The combination in a furnace of a masonry breast with a slag opening C and a water pipe M having small orifices M' embedded in the breast in front of the opening E.

MALVERN W. ILES.

Witnesses:

JOHN S. WILLIAMS,
D. A. JONES.