

# United States Patent Office.

ABRAM REESE, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 114,854, dated May 16, 1871.

## IMPROVEMENT IN "FIX" FOR PUDDLING AND OTHER FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

### *To all whom it may concern:*

Be it known that I, ABRAM REESE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful improved Bottom and Fix for Puddling-Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof.

In the construction of boiling and puddling-furnaces the bottom plate is commonly made of cast-iron. To prevent this plate from burning away from the action thereon of the melted iron, in the process of puddling or boiling, a covering is required for this bottom plate, or, as it is technically called, a "bottom." This bottom should be of such character as not to be readily fused or burned away, also such as not to act injuriously on, and if possible such as to act beneficially on or "nourish" the iron which is being converted, and as all or the greater part of the material used in making the bottom is practically wasted or lost, it should be such as can be made at small expense. For this purpose wrought scrap-iron, reduced to cinder by heat and atmospheric action, has been used, but a bottom so made is costly and not sufficiently durable. Puddling-furnace cinder, squeezer cinder, and hammer cinder have also been used with varying degrees of success.

My improvement relates to the utilization for this purpose of another variety of "cinder," commonly known as "heating-furnace cinder," which has heretofore been regarded and treated as a waste, useless product. This cinder is such as is given off in the reheating of muck-iron preparatory to reworking.

The muck-iron, put up commonly in billets or fagots, is placed on a sand-bed in a heating-furnace, and the exuding cinder, carrying with it sand and other foreign matter, runs off at the flue, and is thrown away as slag, that being the name by which it is commonly known.

To prepare my improved furnace bottom I take this slag, with its impurities, just as it comes from the

heating-furnace flue, place it in the puddling or boiling-furnace, melt it, and while in a liquid state I subject it to the action of an alkaline flux, which causes the sand and other foreign matter to rise to the surface of the molten slag. Here the sand, &c., may be converted into a gas by the action of the heat and so carried off; or it may be splashed around into the sides of the furnace, or tapped off the top, the main object being to get rid of its presence in the molten slag. For the purpose named various alkaline ingredients may be used, but I prefer to use unslaked lime, in the proportion of about one part of lime, by weight, to one hundred of slag.

The separation of the sand from the molten slag is accomplished in a very short time, and then the latter is allowed to chill or solidify, forming a durable and almost costless covering or bottom. If desired, it can also be applied as a "fix" to the sides of the furnace by putting up while hot, in the manner employed in hot-fixing.

Also the slag, after being freed from its impurities as above described, may be run out into some suitable receptacle while still in a liquid state, and, after being ground or broken up, can be used in the preparation of a bottom or hot or cold fix by methods already well known.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The utilization of heating-furnace slag, substantially as hereinbefore set forth.

2. A furnace bottom made of heating-furnace slag treated with a suitable alkaline substance, while in a molten state, substantially as set forth.

In testimony whereof I, the said ABRAM REESE, have hereunto set my hand.

ABRAM REESE.

Witnesses:

JOHN GLENN,  
JAMES I. KAY.