

# UNITED STATES PATENT OFFICE.

JACOB REESE, OF PITTSBURG, PENNSYLVANIA.

MANUFACTURE OF NON-CALCAREOUS LININGS FOR METALLURGICAL FURNACES.

SPECIFICATION forming part of Letters Patent No. 292,508, dated January 29, 1884.

Application filed August 23, 1883. (No specimens.)

*To all whom it may concern:*

Be it known that I, JACOB REESE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Non-Calcareous Linings for Metallurgical Furnaces, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention consists in a new and useful mode of producing and repairing basic linings of converters, and also in the finished lining produced thereby.

Heretofore it has been usual, as described by me in previous applications, to form basic linings from mixtures of lime or highly-burned lime and tar, or of magnesian lime blocks. All modes of forming and repairing lime linings involve considerable care, labor, time, and expense. In my present invention I therefore propose to produce a non-calcareous basic lining, and to form it by running fused and highly-fluid metallic oxides around a suitable core or mold which has been previously inserted within the converter, furnace, or metal-working chamber, so that a single dense, hard, compact, solid mass of metallic oxides of suitable shape will form the finished lining.

In the practice of this invention I make a mold of a shape and form to correspond with the shape and form to be imparted to the interior surface of the lining to be produced. For converter and similar linings I prepare a mold or core, preferably of iron or steel, formed in sections and provided with suitable means for keying or securing them together. The converter is turned up, the bottom is taken off, the sections are inserted and adjusted into position and secured together, thus leaving an annular space between the outer surface of the core and the inner surface of the converter. This annular space extends from the bottom of the converter, where it is closed by a bottom plate, up to the mouth of the converter, where it is closed by a casting-plate provided with a gate, thus forming an inclosed annular space of a shape and form to correspond with that

of the lining to be produced. The converter being in readiness, oxide of iron, titaniferous iron ore, or chrome ore may be charged, either separately or together, into a previously-heated cupola and fused. As soon as the melted oxide has assumed a highly fluid state it is tapped off from the cupola and run through a suitable trough into the gate of the casting-plate, and passes down into and gradually fills up the annular space between the converter-core and the inner walls of the converter. As soon as the lining has set, the top and bottom plates are removed, the sections are disconnected and withdrawn, thus leaving the lining formed of one single mass of dense, hard, solid oxide. In lining the bottom it is placed in a horizontal position, with the right side up, and covered with a plate having suitable perforations to receive the tuyere-cores. The cores are inserted and the melted oxide of iron is then run in through a suitable casting-gate in the top plate. The top plate and cores are then removed and the bottom is attached in the usual manner to the converter.

In lining different-shaped metallurgic working-chambers the only changes necessary will be to construct cores adapted to produce the different shape and thickness of lining desired.

In making repairs to partially-worn linings the operation is performed as before described.

These non-calcareous linings and bottoms are adapted to the use of the class of Bessemer converters which are provided with air and water jacketed sides and bottoms, as described by me in an application filed June 31, 1881, for "converting crude cast-iron into cast-steel," and in the application of Josiah W. Ells, filed November 15, 1881, for Bessemer converters. As the linings are not of a highly-refractory nature, they would wear down rapidly if applied to the ordinary converter; hence such use is not recommended.

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

1. The method herein described of forming and repairing non-calcareous basic linings of

Bessemer converters, which consists in melting non-calcareous metallic oxides in a suitable vessel or refining-chamber, and then casting the fluid oxide into the converter and around a suitable core, substantially as and for the purpose specified.

2. As a new article of manufacture, a non-

calcareous basic lining consisting of a single mass of hard, close, dense non-calcareous metallic oxides, substantially as described.

JACOB REESE.

Witnesses:

WALTER REESE,

C. C. LEE.