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F. STÖHR

METHOD OF BAKING THE LININGS OF CRUCIBLES

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Fig. 1

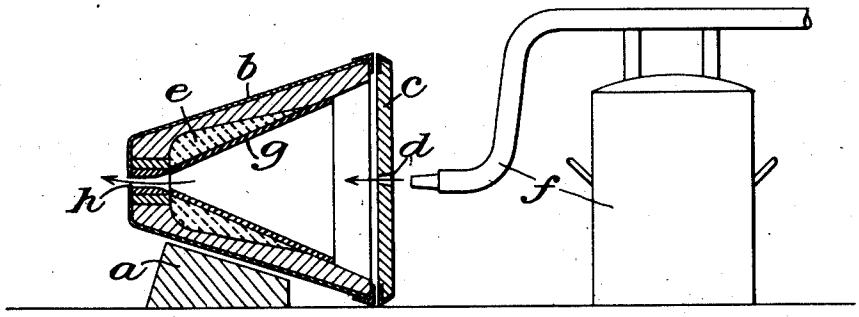
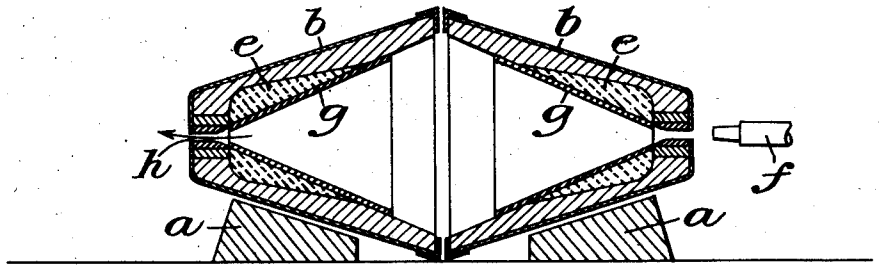


Fig. 2



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METHOD OF BAKING THE LININGS OF CRUCIBLES.

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The invention relates to the method of baking the linings of crucibles generally employed in alumino-thermic operations and provided with a bottom tap opening, said method comprising the temporary closing of the top of the crucible save for an opening to admit a jet of combustible fluid, projecting said jet through the opening so that the burning fluid will bake the applied plastic lining, and exhausting the products of combustion through the tap opening of the crucible.

Crucibles usually employed for carrying out the alumino-thermic operation, more especially in forming welds and castings, consist of an iron shell lined with a suitable refractory material, such as magnesite in combination with a cohesive or binding agent, preferably tar, the magnesite mixture being applied to the interior of the shell in a plastic condition. Before these crucibles can be used, it is necessary that the lining be thoroughly baked in order to drive off all of the volatile elements thereof and leave the refractory magnesite alone to constitute the lining. Heretofore these operations have been carried out in a special furnace in which the lined crucibles were surrounded by hot gases.

The present invention is designed to obviate the expense of constructing and maintaining these heating furnaces and to admit of the crucibles being quickly and effectively lined or relined at the places where they are used, or at other convenient places. The application of the method is illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation, partly in section, of a single crucible associated with the means for effecting the baking of the lining thereof.

Fig. 2 is a sectional elevation of two crucibles arranged for the simultaneous baking of the linings thereof.

Referring to Fig. 1 of the drawings, *b* indicates the shell of a crucible, such as commonly employed in alumino-thermic operations, provided with a tap hole *h* in the bottom thereof, by means of which the products of the alumino-thermic reaction are discharged from the crucible. The crucibles are provided with a lining *e* of refractory material, primarily to protect the iron shell from the superheated products of the reaction, which lining, as stated, preferably consists of magnesite admixed with tar and applied as a coating or lining, while in plastic condition, to the interior of the shell. After the lining has been applied, the crucible is preferably placed on its side and supported in position by a suitable block *a*. The open end of the crucible is closed by means of a suitable cover *c*, preferably of iron or the like, provided with a central opening *d*, and a jet of combustible fluid fuel from any suitable source, as, for example, a blow torch or a portable reservoir containing an admixture of combustible gases producing a relatively hot flame, as conventionally illustrated at *f*, is directed through the opening, so that the burning gases come in contact with the plastic lining and heat the same so as to drive off all of the volatile constituents in the lining and bake the latter until it is entirely dry and effectively resistant to the products of the alumino-thermic reaction.

Preferably, in order to maintain the lining in proper position during this baking or drying operation, the inner surface of the lining is covered with a metallic sheath, which may take the form of a frustum of a hollow cone *g* with the small open end thereof in alignment with the tap opening of the crucible, which sheath is removed after the baking operation has been completed.

When two crucibles of substantially the same size are to be lined or relined, they are preferably positioned as shown in Fig. 2, namely, with their open ends juxtaposed at the rims thereof, thereby mutually closing the tops of the crucibles, after which the jet of combustible fluid fuel is introduced through the tap opening of one crucible, and the products of combustion exhausted through the tap opening of the other crucible.

The particular advantage of either of these alternative modes of applying and baking the linings of crucibles is that the operation may be carried out at a minimum of labor and expense at the places where the crucibles are used and with apparatus commonly employed in alumino-thermic operations, as, for example, the ordinary blow pipes or torches usually employed for preheating the interior of the molds and the sections of the materials enclosed therein, which are to be welded.

What I claim is:

1. The method of baking the refractory linings of crucibles provided with an open top at one end and a tap opening at the other end, which comprises applying a closure to

the open top of the crucible, projecting a combustible fluid jet through said opening, and venting the products of combustion through the tap opening.

2. The method of baking the linings of crucibles provided with tap openings, which comprises covering the plastic lining with a metallic sheath, applying a closure to the top of the crucible, projecting a combustible fluid jet through an opening in the closure, and venting the products of combustion through the tap opening.

3. The method of baking the linings of crucibles provided with bottom tap openings, which comprises mutually closing the tops of the crucibles by juxtaposing the top rims thereof, introducing a combustible fluid jet through the tap opening of one crucible and exhausting the products of combustion through the tap opening of the other crucible.

4. The method of baking the linings of crucibles provided with bottom tap openings, which comprises covering the plastic linings with metallic sheaths, mutually closing the tops of the crucibles by juxtaposing the top rims thereof, introducing a combustible fluid jet through the tap opening of one crucible and exhausting the products of combustion through the tap opening of the other crucible.

In testimony whereof I affix my signature.

FRANZ STÖHR.