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(1879 - 1926)

Luxembourg-city

1 - Improvements in or connected with the manufacture of iron or steel by the basic Bessemer process

GB patent	1906/16440
Application date	20 July 1906

In the Thomas process it is well known to be a great advantage to keep the charge as hot as possible during the first, or so-called decarburising period, and not to introduce cooling additions into the converter before the so-called dephosphorising period.

A high temperature during the decarburising period is attained by charging the converter, heated as high as possible, with superheated pig iron, reducing the addition of lime to a minimum, and not placing any scrap in the converter during the first period of the process.

In order to then cool the charge during the dephosphorising period, the method hitherto adopted has been to tilt the converter and add scrap or lime.

Cooling the charge with scrap, however, is a very expensive operation, since a considerable portion of the scrap which passes through the viscid condition before melting, is retained by the slag and carried off therewith; moreover the price of scrap, already high, is continually rising, and such iron and steel scrap are most advantageously used in the open hearth furnace.

Cooling the charge with lime is still more disadvantageous than with scrap. Apart from the expense entailed by the addition of lime, the value of the Thomas slag is reduced, its contents of phosphoric acid being lessened. With a large addition of lime the slag thickens, i.e. becomes more viscid and retains larger quantities of iron, thus increasing the amount of refuse. Moreover, lime only cools the bath very slowly, being itself a bad conductor of heat, consequently during the reheating of the charge after the addition of lime, a considerable amount of iron, in addition to the phosphoric, acid, is burnt, since the cooling of the overheated bath does not proceed with sufficient speed, and this circumstance also helps to increase the amount of refuse.

In accordance with the present invention, the converter is tilted toward the end of the decarburising period or later, for the purpose of finishing the charge, and is charged with an addition of a mixture of calcium hydroxide (slaked lime) or other suitable substance such as a mixture of limestone or unburned lime and clay and substances containing ferric oxide. With regard to this latter, use is preferably made of substances such as hammer scale, rolling-mill dross or other suitable substances containing ferric oxide, such as rich iron ores, or rich pulverulent ores, such as occur in Brazil, and the mixture of ferric oxide and calcium hydroxide or the like is preferably compressed into briquettes, the CaH_2O_2, acting also as a binding medium for the oxide.

(no drawing)

Corresponding patents

US, CA, LU (2)

2 - Improvements in the manufacture of iron or steel by the open hearth process or in electrical furnaces

GB patent	1907/19348
Application date	28 August 1907

In the direct reduction of iron ores into steel it has long since been proposed to form briquettes of iron ore crushed limestone and carbonaceous materials and to charge same into a molten bath of pig metal in which such briquettes become dissolved and assist in the decarburization of the pig metal, while in my own prior Specification 16440 of 1906 [see invention n° 1] *I have proposed that briquettes of a mixture of ferric oxide and calcium hydroxide should be added toward the end of the decarburizing period in the Bessemer converter and according to the present invention it is proposed to employ these known forms of briquettes but without the addition of carbon thereto, in the open hearth process not with the desire of reducing ore or pig metal directly into steel but for the purpose of rapidly securing the removal of the impurities remaining in the ingot iron or steel already produced in the ordinary open hearth process.*

To this end it is proposed that, when in the ordinary open hearth process, whether carried out in a single furnace or by removal of the nearly purified metal to a second furnace, to add to the bath briquettes of practically pure iron oxide and slaked lime (calcium hydroxide) toward the end of the process or when it is found that the removal of the remaining impurities becomes slow and proceeds with difficulty.

The briquettes should consist chiefly of pure iron oxides with calcium hydroxide (slaked lime) as the binding medium, preference being given to rolling mill scale, high percentage ore dust and the like to which may be added iron scrap, such as turnings, filings or the like.

(no drawing)

Corresponding patents

US, CA,