

Your artificial iron-ore, both mechanically and chemically, seems to me very well suited for the blast furnace, and the iron produced (sample of which you sent me) is excellent in quality, and, no doubt, very pure chemically.

The "direct process" of my own, and that of my brother, the late Sir William Siemens, are not yet sufficiently advanced to enable me to recommend their adoption on a commercial scale, as hitherto it has been found such "direct processes" are at some disadvantage as compared with the blast furnace and puddling furnace, or the blast furnace and the Siemens open-hearth steel melting furnace, as regards the cost of production. I think the combined processes of (1) smelting in the blast furnace, and (2) reducing the artificial iron-ore in my open-hearth steel furnace in contact with a bath of molten pig-iron made in process (1) would be the most economical.

The new form Siemens furnace, which costs less money to build (only about one-half) than the ordinary form Siemens furnace (with four regenerators and separate gas-producers), would be very suitable for this process, for which I should be glad to furnish you with a complete set of working drawings on terms to be arranged.

Enclosed you will find description circular on this furnace, which has been adopted in this country, and on the Continent of Europe, for making steel castings, steels of varying tempers, and soft steel or ingot iron. The same type of furnace has been very largely applied also for reheating ingots, blooms, billets, iron piles, &c., and I am doing a regular business at these offices in supplying drawings for such furnace, and setting them to work in England, Belgium, France, Spain, &c.

I should propose that the pig-iron made in the blast furnace from your artificial ore be melted with 30 per cent. of its weight in my open-hearth furnace for the production, in ingots, of soft steel for bars of all sections, forgings, &c. The whole of the iron in that 30 per cent. of ore will be reduced to the metallic state very cheaply, and if carbon is also added to the ore-mixture it is probable as much as 50 per cent. of ore could be treated (in a 10-ton charge, 5 tons of pig-iron and 5 tons artificial iron-ore).

I could supply you at the most moderate prices with the materials for the Siemens open-hearth steel melting furnace, and of the mill for rolling the ingots so produced direct into merchantable bars. It is very probable also that I could arrange for expert workmen to go out to work the new plant.

If the combined processes of the blast furnace and the Siemens open-hearth furnace as suggested does not meet with your approval, perhaps I can recommend to you the best and most reliable "direct process," although in this country I do not think it would compete in cost of production with the blast furnace, and the well-known processes for treating the pig-iron produced. To enable me to do this, however, you should send me, say, $1\frac{1}{2}$ tons of ironsand, $\frac{3}{4}$ tons of the fluxing material, and a few hundredweights of the artificial iron-ore (if you have any in stock), freight paid to this address. I would get these materials treated by a direct process, and afterwards report to you upon the results; so that you could see if it would pay in your country or not.

You may rely upon my assisting you so far as I am able, and giving you the best advice I can in the matter, and I trust that some business of mutual advantage to us will result. Awaiting your reply,—

I am, &c.,

Per pro FREDERICK SIEMENS,
CON. W. HARVEY.

A. S. Minett, Esq., Britannia House, Vincent Street, Auckland.

10, Queen Anne's Gate, Westminster, London, S.W.,
22nd November, 1894.

SIR,—

I duly received and thank you very much for your interesting letter of the 28th September last, the contents of which are carefully noted. Up to now the samples you speak of have not arrived, and I await them with interest.

I expect to be able to write to you fully on the subject of your communication in course of a week or two.

I am, &c.,

Per pro FREDERICK SIEMENS,
CON. W. HARVEY.

A. S. Minett, Esq., Britannia House, Vincent Street, Auckland.

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