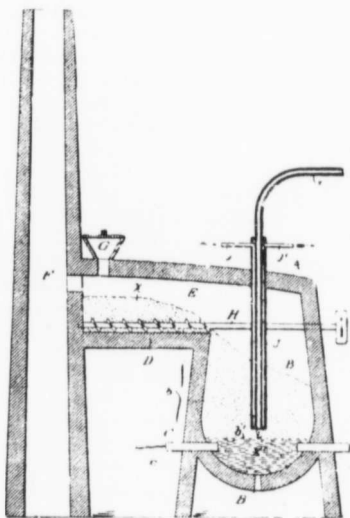


be approached. The poles are surrounded by water-cooled bronze rolls covered with carbon plates, which rotate in opposite directions. Along the lines of closest approach an electric arc is formed, which subjects the material to be operated upon to a high temperature. The material is fed upon one of the rolls, and is thus carried to the active zone dropping out of the reach of its influence as the revolution of the rolls carries the material beyond it.

When the ore does not possess magnetic properties to certain degree Mr. Ruthenberg uses cast-iron borings in order to create the arc, the percentage varying with the circumstances. When putting the ore through the machine alone the action is sluggish and the capacity suffers. The result of this operation is a fritted material, which is in much better shape mechanically for charging into the blast furnace than the crude ore.



Mr. Ruthenberg makes the important point that during the exposure of the ore to the action of the electric arc a considerable part of any sulphur in the ore is eliminated.

A somewhat more interesting operation is the direct reduction of iron ore in the electric arc. The fine ore is mixed with carbon in a suitable form, and if desirable cast iron borings are also added. Exposure of the mixture in the electric light causes a reduction of the iron oxide, and there drops from the rolls a coarse, partly sintered material, which is largely iron in metallic form. This product is employed in the place of scrap in the open hearth furnace, one charge having been made with it at a leading steel plant.

The rated capacity of the machine is about two and a half to three tons of material per day of twenty hours, but it is the intention to build a larger machine, with rolls three times as long, which, it is expected, will reach a capacity of ten tons per day. The electric energy required for the machine is about 25 horsepower.

P.S.—The foregoing is copied from the *Mechanical Engineer* of March 28th, a Manchester publication, and I forward it to you as I believe it will be of interest to your readers.

FRENCH STEEL.

SEVERAL mine managers in British Columbia have been victimized in the past few months by the agent of a French steel works, who, on the strength of very excellent samples, has succeeded in obtaining large orders for steel, which upon delivery has proved to be worthless. The same sort of thing has been done in Australasia, and we print the following correspondence and editorial comment published by a Melbourne contemporary on the subject:—

To the Editor, *The Australasian Hardware and Machinery.*

SIR: During the past year New Zealand witnessed the advent of a French metalician, who, to prove the merits of his brand of steel, visited the principal engineering shops of the colony, and submitted his material to tests, which were very successful. The persistent exhibitor and salesman did considerable business, but he sold in metric terms, and few, if any, of his customers secured a note of the sizes and lengths ordered in our English measurements. From one end of the colony to the other, it is said, dealers believed they were ordering a couple of feet of each size as samples. The price was fairly high, but as the cutting edge of the steel was first class, the unsuspecting foundrymen were willing to give a fair, or even high rate for good material.

In due time, the invoices came to hand, and the steel was landed. Judge the astonishment of the buyers, when they found the bills running to hundreds of pounds, the bars arriving in about 18-foot lengths. Comparing notes, our foundry proprietors found to their mutual chagrin that each was as bad as the other in his careless ordering. One or two of the larger and busier works were disposed to take up their purchases, and did so, only to find that the quality was not as anticipated. Others decided not to touch the shipment, determining to abide by the sample submitted, and the lengths which they understood had been ordered. As far as one can learn, the only person who got his exact order filled to his own requirements was a blacksmith near Christchurch. The engineers of the colony are uniting to test their position, having generally come to the conclusion that they have had dumped on them an enormous quantity of useless steel. The final act of this little comedy will be awaited with interest.

Yours, etc.,

AUCKLAND.

SIR: Adverting to the letter in your current issue, the trouble arising through orders for steel placed in France is not confined to New Zealand by any means. Several Australian founders, were the matter not so painful, could tales unfold. Some of them took