

UNITED STATES PATENT OFFICE.

HUGO CARLSSON, OF SYDNEY, CANADA, ASSIGNOR OF ONE-HALF TO
JAMES H. LE FEVRE, OF SYDNEY, CANADA.

METHOD OF PRODUCING OPEN-HEARTH STEEL.

SPECIFICATION forming part of Letters Patent No. 768,265, dated August 23, 1904.

Application filed October 5, 1903. Serial No. 175,794. (No specimens.)

To all whom it may concern:

Be it known that I, HUGO CARLSSON, a citizen of the United States, and a resident of Sydney, in the Province of Nova Scotia, Dominion of Canada, have invented a certain new and Improved Method of Producing Open-Hearth Steel, of which the following is a specification.

My invention relates to the basic process of manufacturing open-hearth steel, and has for its object such an improvement of said process as will effect a substantial economy in the practice thereof without deteriorating the quality of the steel, and also has for an object the utilization of a material—titaniferous iron ore—that is now of substantially no value.

In carrying on the basic open-hearth process of making steel it is usual to increase the basicity of the slag in order that it may more effectually remove some of the impurities from the metal by adding lime or limestone to the bath. When, however, a certain amount of lime has been added, the slag becomes too thick, and if it is then desired to add more lime it has been necessary to use considerable fluor-spar in order to increase the fluidity of the slag and to allow of more lime being used.

My present invention consists in adding suitable quantities of titaniferous iron ore in the basic open-hearth furnace. The addition of this material, because of the titanic acid present, makes the slag much thinner, and thus serves the purpose for which fluor-spar has previously been used. Moreover, the iron oxid of the ore acts to some extent upon the carbon in the bath to reduce the carbon contents of the same. I have found that in this way ores containing very large percentages of titanic acid may be used to advantage, and

I believe that the higher the titanic acid in the ore the better. The particular amount of titaniferous ore to be added must, of course, be dependent upon local conditions, as it is necessary for the melter to properly control the character of the slag.

It is well known that there are large deposits of titaniferous iron ores existing in different parts of the world; but hitherto these ores have been substantially without value. Attempts have been made to obtain the iron from them by smelting them in the ordinary manner in a blast-furnace, but this produces highly-refractory slags, which seriously interfere with the action of the blast-furnace. These heretofore unavailable ores vary considerably in the percentage of titanic acid contained in them, but range usually from about two per cent. to about twenty per cent., or even higher. By my invention these ores become at once of value to the steel-maker, since the fluor-spar hitherto used, which is comparatively expensive, may be eliminated or partially eliminated.

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

The herein-described improvement in the basic open-hearth process which consists in controlling the character of slag produced by adding to the other materials employed in said process, a quantity of titaniferous ore suitable for said purpose, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO CARLSSON.

Witnesses:

EDWIN SEGER,
JOHN O. GEMPLER.