UNITED STATES PATENT OFFICE.

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MANUFACTURE OF STEEL.

No. 842,802. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed February 7, 1905. Serial No. 244,659.

To all whom it may concern:

Be it known that I, JOSÉ DE MOYA, a resident of Paris, France, have invented new and useful Improvements in the Manufacture of Steel, which improvements are fully set forth in the following specification.

This invention relates to a process for direct recarburization of cast-iron for the purpose of manufacturing Siemens, Martin, Bessemer, Thomas, and other steel, by means of which an exact and uniformly-distributed recarbonization, and consequently a perfectly homogeneous steel of the exact desired kind, can be obtained. This process is characterized by the combination of two intimately-connected operations, one of which, which could be called the "preparatory" operation, takes place in the furnace or converter, and the other, which could be called the "final" operation, takes place in the casting-ladle exclusively during the casting of the metal.

The preparatory operation consists in adding to the cast-iron a mixture of salts of soda and potash selected from among those that do not affect the lining of furnaces or retorts, or only one salt can be used—for instance, chlorid of sodium. The quantity of material to be used either separately or in mixture is about two kilograms per ton of metal to be obtained at the casting. This quantity can, however, vary in accordance with the nature of the metal treated or in accordance with the special results to be obtained. The addition of the mixture or of chlorid of sodium alone can be effected in the retort or converter before the introduction of the cast-iron or during the operation or at the end of it. The special and sole object of this addition is to prepare the metal, chiefly by liquefaction of slags and elevation of temperature rendering the mass homogeneous, to receive and properly utilize the second addition, which is effected in the casting-ladle.

The second or final operation consists in adding in the casting-ladle and exclusively during the casting some pulverized carbon inclosed in wrappers or envelops of wood, paper, canvas, &c., which easily burn or melt, but are always of a determined capacity or contents. These envelops or bags are introduced into the casting-ladle so that the introduction commences only when there is a certain quantity of metal in the ladle—say up to the level of one-third of the ladle—and introduction must be effected at regular intervals and be completed before the slag arrives into the ladle and in any case a little before the end of the filling of the ladle.

It is advantageous to use bags of five kilograms capacity irrespective of the proportions of the other ingredients mentioned. In these conditions, as the introduction of the bags takes place during the casting of the metal, they are not sufficiently heavy to escape the action of the metal eddies in the ladle, and the whole of the carbon is absorbed by the metal before the bag can arrive at the bottom of the ladle, where by its accumulation the carbon would have become massed, which must be avoided.

I claim—

In the manufacture of Siemens, Bessemer, Martin, Thomas, and other steels, the process of direct recarburization consisting in adding chlorid of sodium to the molten charge in the converters, furnaces, &c., for the purpose of rendering the slag more easy to melt and of raising the temperature of the bath, introducing said treated metal into the casting-ladle till it is about one-third full and adding thereto at regular intervals carbon in amounts of five kilograms in combustible containers, said addition of carbon being completed before the appearance of slag in the ladle and before the filling of the latter with metal.

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

JOSÉ DE MOYA.

Witnesses:

EMILE LEDRET,

JULES TOUSSET.