UNITED STATES PATENT OFFICE.

JOSEPH B. RENSHAW, OF HARTFORD, CONNECTICUT.

PROCESS OF ELIMINATING GRAPHITIC CARBON FROM CAST-IRON.

SPECIFICATION forming part of Letters Patent No. 438,715, dated October 21, 1890.

Application filed August 8, 1889. Serial No. 320,150. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH B. RENSHAW, of Hartford, Connecticut, have invented a new and useful Improvement in the Process of Eliminating Graphitic Carbon from Cast-Iron, of which the following description and claim constitute the specification.

This invention is particularly applicable to the manufacture of pig-iron; and it consists in the process of eliminating graphitic carbon from melted iron by means of iron oxide compounded with vegetable fiber, and then added with its vehicle to the iron to be melted or being melted or previously melted.

The processes involved in this invention are as follows: Iron oxide is prepared or procured in pulverized form in any convenient manner, and sawdust, shavings, straw, or other vegetable fiber, of which the wood material used by upholsterers and called "excelsior" is a good variety is procured and saturated with water to a suitable degree, of which three pounds of water to one pound of fiber is a proper example. The iron oxide is then thoroughly mixed with the saturated fiber, and this mixture results in the absorption of the iron oxide by the fiber and in a consequent product resembling such fiber, except in being much heavier in weight and darker in color. That product when sufficiently dried is preferably divided into definite portions of equal or unequal quantities and placed and kept in paper bags or other packages for ultimate use. When it is desired to eliminate graphitic carbon from molten iron, one (or more) of these packages, with its contents, is placed in the furnace upon the iron before it is melted or in the iron when it is melted, as the case may be. The inclosing-package is duly consumed and the contents thereof discharged upon or into the molten mass, and as the fiber burns the iron oxide is released in separate particles to the action of the heat and to the chemical actions consequent upon its contact with the melted iron. Those chemical actions consist in the union of the oxygen in the iron oxide with a corresponding quantity of the graphitic carbon in the melted iron, thus forming carbonic-oxide gas, which passes out of the molten mass into the air, and also consist in another quantity of the graphitic carbon in the melted iron uniting with the iron of the iron oxide, which latter is thus incorporated with the molten mass. Thus the proportion of graphitic carbon in the molten iron is reduced, and that reduction may be made more or less extensive according to the purpose for which the iron is ultimately to be used. For example, the proportion of graphitic carbon in the molten iron may be reduced by this process from three and one-half per cent., which is a suitable proportion for one kind of castings, to one per cent., which is a suitable proportion for another kind of castings.

It is not new to treat molten iron by means of introducing oxide of iron into the molten mass; but I believe it is original with me to introduce iron oxide into molten iron by first mixing pulverized-iron oxide with vegetable fiber, and then casting the combined product into contact with the iron from which the graphitic carbon is to be elimited.

The particular utility of my invention resides in the fact that it is superior to casting pulverized-iron oxide upon or into melting or melted iron, because such pulverized-iron oxide when thus cast is blown away by the blast which supports the combustion of the fuel and maintains the fluidity of the iron before it can form the chemical unions above indicated, and also resides in the fact that it is superior to casting a compact mass of iron oxide upon or into melting or melted iron, because such mass when thus cast undergoes immediate melting of its exterior particles and the consequent conversion of those particles into a metallic iron shell, which thereafter incloses the interior particles of the mass and prevents those portions from operating, as above set forth, on the graphitic carbon in the melted iron.

I claim as my invention—

The process of eliminating graphitic carbon from melted iron by means of iron oxide, which consists in first mixing vegetable fiber with pulverized-iron oxide, and then adding the compound to the iron to be melted or being melted or previously melted, all substantially as described.

Hartford, Connecticut, August 7, 1889.

JOSEPH B. RENSHAW.

Witnesses:

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