UNITED STATES PATENT OFFICE.

BENJAMIN TALBOT, OF CHATTANOOGA, TENNESSEE, ASSIGNOR OF ONE-FOURTH TO JAMES MEEHAN, OF COVINGTON, KENTUCKY.

PROCESS OF MAKING MALLEABLE-IRON CASTINGS.

SPECIFICATION forming part of Letters Patent No. 481,313, dated August 23, 1892.

Application filed February 12, 1892. Serial No. 421,327. (No specimens.)

To all whom it may concern:

Be it known that I, BENJAMIN TALBOT, a subject of the Queen of Great Britain, but having declared my intention of becoming a citizen of the United States, and residing at Chattanooga, Hamilton county, Tennessee, have invented certain new and useful Improvements in the Process of Making Iron for Malleable-Iron Castings, of which the following is a specification.

It is customary in the manufacture of malleable-iron castings to charge gray pig-iron into an air-furnace, where it is desiliconized, producing a white iron, from which the castings are made, the castings being subsequently annealed, whereby the combined carbon is eliminated, no effect being had upon the graphitic carbon. If white iron were charged to the furnace, it would during the process become too low in combined carbon to lend itself to the annealing process. By my improved process I am able to use white iron or even decarbonized metal, as old malleable scrap, steel-scrap, or even tin-scrap, and from these cheap materials I am able to get castings sharply filling the molds and adapted in the highest degree for the annealing process.

Into an ordinary cupola, melting with coke, I charge low-carbon metal to be dealt with and with it I charge ferro-silicon. The melted metal tapped from the cupola is high in carbon; but the carbon is too highly graphitic. It is too low in combined carbon and too high in silicon for the purposes of malleable castings. I therefore put the metal into an ordinary air-furnace or converter and oxidize the silicon, thus reducing the silicon and changing the carbon to combined form, giving the desired composition of metal, and the oxidation of the silicon gives the high heat and fluidity requisite to the making of the castings in sharp correspondence with their molds.

Instead of withdrawing the metal from the cupola and oxidizing it in an air-furnace the cupola itself may be employed, after the manner of a converter, in operating by suitable tuyeres on the charge of carburized and siliconized metal within it, the cupola in such case acting, first, as a melting and carburizing apparatus, and, second, as a desiliconizing apparatus, it being understood that the silicon is put into the metal for the very purpose of being later oxidized. It is of course to be understood that I make no claim to the mere use of ferro-silicon in the cupola, as that has long been done for the purpose of improving the metal.

I claim as my invention—

That improvement in the art of making iron for malleable-iron castings which consists in melting metal deficient in carbon, together with added ferro-silicon, in the presence of and by means of solid carbonaceous fuel, and subsequently sufficiently oxidizing the silicon to properly change the graphitic carbon to combined carbon.

BENJAMIN TALBOT.

Witnesses:
O. L. HURLBUT,
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