

UNITED STATES PATENT OFFICE.

AUGUSTE J. ROSSI, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO THE TITANIUM ALLOY MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

PROCESS FOR PRODUCING THE ALLOY OF TITANIUM WITH TIN.

1,022,598.

Specification of Letters Patent.

Patented Apr. 9, 1912.

No Drawing.

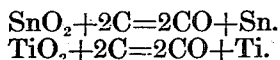
Application filed February 4, 1911. Serial No. 606,454.

To all whom it may concern:

Be it known that I, AUGUSTE J. ROSSI, a citizen of the United States, and a resident of Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Processes for Producing the Alloy of Titanium with Tin, of which the following is a specification.

My present invention relates to the production of said alloy by a novel method which, under special conditions and for special purposes, possesses advantages both in practice thereof and in resulting products. Letters Patent No. 979,394 were granted to me December 20, 1910 for a method of producing said alloy by aid of aluminium reduction of titanium oxid as therein described. My researches have now satisfied me that the said alloy may also for some purposes, notwithstanding the peculiar characteristics of tin, be also satisfactorily produced by aid of carbon reduction of titanium oxid, though usually this method and its resulting product will prove, in my opinion, less desirable than that covered by my aforesaid patent.

My said alloy of titanium and tin I produce by the method of my present invention as follows. Into an electric furnace of any of the now well known forms, as for example such as illustrated and described in Letters Patent No. 802,941, granted to me October 24, 1905, I charge a mixture, preferably intimate, of oxid of tin, oxid of titanium and carbon, as for instance per the formulæ



To this mixture I also preferably add some tin. The current is then turned on. This, the temperature being sufficiently raised, will result in production of a bath of molten tin, and reduction also of the titanium oxid, the titanium resulting from which mingles or dissolves in said bath of tin to constitute the said alloy. The addition of tin in metallic state, though not absolutely necessary, facilitates the reduction of the titanium oxid by the carbon.

In producing said alloy by my said process, in operations conducted on an industrial scale, it is preferable, if not indispensable, owing to the characteristic properties of tin under the conditions mentioned, to interpose between the atmosphere and the charge a liquid coating comprising molten neutral substances such as slag by superimposing and maintaining such coating as, for example, described in my Letters Patent No. 877,518, granted January 28, 1908. The procedure is such that the resulting alloy usually contains some carbon, often in excess of 1% derived from the electrodes of the electric furnace by the well known carburizing action of the arc, or also due, under the conditions of industrial practice, to the difficulty of exactly proportioning the reducing agent so as to merely satisfy chemical affinity therefor of the oxygen present without leaving some uncombined carbon. This circumstance is of no detriment to the product for many purposes, but will prove of advantage in certain special uses thereof.

What I claim as new and desire to secure by Letters Patent is the following, viz:—

1. The method of producing the binary alloy of titanium with tin, which comprises charging together oxid of tin, oxid of titanium and carbon, and raising the temperature sufficiently to produce a bath of molten tin, and reduction also of the titanium oxid, substantially as described.

2. The method of producing the binary alloy of titanium with tin, which comprises reducing titanium oxid by carbon in a bath of molten tin, substantially as described.

3. As a new article an alloy, or compound, consisting predominantly of titanium and tin alloyed together and containing also some carbon.

4. As a new article an alloy, or compound, consisting predominantly of titanium and tin alloyed together and containing also carbon in excess of 1%.

AUGUSTE J. ROSSI.

Witnesses:

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PHILIP C. PECK.