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UNITED STATES PATENT OFFICE

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PROCESS FOR THE PRODUCTION OF ALLOYS CONTAINING BERYLLIUM

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No Drawing. Original application August 9, 1939, Serial No. 289,177. Divided and this application April 19, 1941, Serial No. 389,416. In Germany June 5, 1939

2 Claims. (Cl. 75—135)

This invention relates to a process for the production of alloys containing beryllium being described in detail in my co-pending application Serial No. 289,177, filed August 9, 1939, of which this application is a division.

Beryllium is generally alloyed with other metals by adding it in metallic form to the molten base metal whilst maintaining the melt at a temperature sufficiently high to cause dissolution of the beryllium in the base metal, and preferably whilst stirring.

It has however been observed that metallic beryllium and especially beryllium which has been obtained in the form of flakes or the like by the thermal reduction of beryllium compounds, alloys only with difficulty. It has now been ascertained that this difficulty is due to the fact that it is impossible to avoid superficial oxidation of the metallic beryllium, especially in separating it from the non-metallic reaction products by lixiviation, prior to employing said beryllium for alloying purposes, the coating of oxide formed on the flakes of metallic beryllium, preventing dissolution of the beryllium by the base metal.

The present invention aims at obviating the foregoing difficulty by omitting the step of separating the metallic beryllium from the non-metallic reaction residues formed during its production.

In accordance with the invention, therefore, a mixture containing beryllium in the metallic state, which has been produced by reducing a beryllium compound with the aid of a reducing metal, is combined with the base metal to be alloyed with the beryllium in the molten state. The reducing metal employed for producing the said mixture is preferably an alkali or alkaline earth metal (including magnesium) and the reducible beryllium compound is preferably represented by a beryllium halide, especially beryllium chloride. The mixture containing beryllium in the metallic state may also contain other saline compounds, which, in a manner known per se, may be added in the production of the said mixture in order to damp the reaction and/or to lower the melting point of the non-metallic reaction residues.

In carrying out the invention there is added to the base metal with which beryllium is to be alloyed a mixture obtained by reducing a reducible beryllium compound such as beryllium chloride with a reducing metal such as magnesium and consisting substantially of metallic beryllium and the corresponding compound of the reducing metal, which mixture will hereinafter shortly be referred to as "reacted mixture."

According to the invention said reacted mixture is allowed to solidify and may even be stored, under suitable conditions prior to being used.

In carrying out the invention, the base metal in the form of turnings or the like, may be mixed with the solidified and broken up reacted mixture and the whole then heated to the requisite temperature for the formation of the desired alloy.

The small amounts of beryllium remaining in the reacted mixture (partly in the form of oxide) on completion of one of the aforementioned alloying operations can be recovered by pouring off the saline melt floating on the top of the now formed alloy, allowing it to solidify and when cold, treating it with water and finally reconverting the undissolved beryllium-containing residues into beryllium chloride by chlorination.

I claim:

1. A process for the production of beryllium containing alloys, in which a solidified mixture obtained by reacting a beryllium halide compound with a reducing metal, and comprising metallic beryllium and the corresponding halide compound of the reducing metal, is mixed with the base metal of the alloy to be produced in comminuted form, and the mixture is heated up to a temperature sufficient to cause formation of the alloy.

2. A process for the production of beryllium containing alloys, in which a solidified mixture obtained by reacting beryllium chloride with magnesium and comprising metallic beryllium and magesium chloride is mixed with the base metal of the alloy to be produced in comminuted form, and the mixture is heated up to a temperature sufficient to cause formation of the alloy.

HELMUT VON ZEPPELIN.

CERTIFICATE OF CORRECTION.

Patent No. 2,251,089. July 29, 1941.

HELMUT VON ZEPPELIN.

It is hereby certified that the above numbered patent was erroneously issued to the inventor, said "VON ZEPPELIN" whereas said patent should have been issued to --Walther H. Duisberg, of New York, N. Y., as assignee by mesne assignments, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of September, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.