UNITED STATES PATENT OFFICE.

GEORGE ALEXANDER DICK, OF LONDON, ENGLAND.

MANUFACTURE OF ALLOYS.

SPECIFICATION forming part of Letters Patent No. 306,228, dated October 7, 1884.

Application filed January 24, 1884. (No specimens.) Patented in Germany November 2, 1882, No. 22,620; in France December 5, 1883, No. 158,982; in Belgium December 7, 1883, No. 63,476; in Italy December 24, 1883, No. 16,021, and in England December 29, 1883, No. 5,914.

To all whom it may concern:

Be it known that I, GEORGE ALEXANDER DICK, of London, England, have invented certain new and useful Improvements in the Manufacture of Metallic Alloys or Compounds, of which the following is a specification.

My said invention consists of improvements in the manufacture of alloys or compounds of copper, zinc, iron, and manganese.

I am aware that alloys or compounds have previously been manufactured from the said materials, but the processes employed have not only possessed various disadvantages, such as requiring a very high temperature for melting, whereby the substances become partly oxidized and eliminated, but the nature of the alloys or compounds produced has consequently been extremely uncertain.

For the purposes of this invention I employ ferro-manganese or spiegeleisen containing up to seventy, and even more, per cent. of manganese. The proportional constituents of the ferro-manganese or spiegeleisen, which are of the ordinary trade character, must be known or ascertained. I dissolve the ferro-manganese in molten zinc to saturation, taking care that the bath is maintained at as high a temperature as possible without volatilizing the zinc—that is to say, to about 1,200° Fahrenheit—and I thus cause the zinc to dissolve or take up as much as possible of ferro-manganese or spiegeleisen, being about eight or nine per cent. in each case. If the bath is kept at a lower temperature than that hereinbefore stated, the amount of ferro-manganese or spiegeleisen taken up will be less than eight or nine per cent., the amount so taken up depending upon the temperature employed.

As the proportional quantity of manganese combined with the iron will, as hereinbefore stated, be known, it is evident that the requisite quantity of iron and manganese can be introduced into the alloy with great nicety and accuracy.

The saturated composition hereinbefore referred to is, with or without a quantity of pure zinc, added to molten copper.

The proportions of copper and zinc I employ in the manufacture of the above alloys are from forty-five to seventy-five per cent. of copper combined with from fifty-five to twenty-five per cent. of zinc compound, containing the ferro-manganese or spiegeleisen, or mixture of the same alone or combined with pure zinc.

Ferro-manganese frequently contains silicium, which increases the tenacity of the alloy, and if the proportion of silicium contained in the ferro-manganese exceeds one-half per cent. I add a proportionally larger percentage of pure zinc than I would if no silicium were present.

The preliminary combination of zinc with the ferro-manganese or spiegeleisen as effected by my method, hereinbefore described, requires but a comparatively low temperature for its formation, the ferro-manganese or spiegeleisen being brought into contact with the molten zinc while in the solid state, (in excess,) whereby the oxidation of the manganese present is avoided, which is not the case when the ferro-manganese or spiegeleisen are melted at a high temperature, as has been heretofore proposed, and then added to the molten copper, it being well known that the ferro-manganese and spiegeleisen require an extremely high temperature to melt them.

I make no claim in the present instance to mixing ordinary iron with molten zinc and combining this mixture with molten zinc, as such a process is set forth in my English Patent No. 2,484, granted A. D. 1884.

What I claim is—

The herein-described method of producing alloys or compounds of copper, zinc, iron, and phosphorus or manganese, or both, consisting in dissolving solid phosphuret of iron or ferro-manganese or spiegeleisen in molten zinc, whereby the oxidation of the phosporus or manganese is avoided, and then adding the compound so formed to molten copper, substantially as herein set forth.

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