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NICKEL ALLOY.

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To all whom it may concern:

Be it known that I, NOAK VICTOR HYBINETTE, a citizen of Norway, residing temporarily at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Nickel Alloys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in nickel alloys and more particularly nickel alloys containing carbon.

In making nickel alloys containing carbon, which are sometimes referred to as carbonized nickel, it has heretofore been considered important and even necessary to have present in the alloy a small amount of silicon, for example, ½ of 1% or more. This silicon may be incorporated with the nickel in various ways. It may thus be introduced, to a greater or less extent, from graphite crucibles owing to the silica which the graphite contains. It may also be introduced from the furnace lining in which the nickel is smelted, where the furnace lining is of siliceous character. In fact, it is practically impossible by common methods of nickel smelting (other than electrolytic) to produce nickel and particularly carbonized nickel which does not contain silicon in considerable amount, that is, a substantial fraction of a percent or even more.

I have found, contrary to the commonly accepted belief, that silicon is not only unnecessary but is even harmful in carbonized nickel for many purposes, and that an improved alloy can be produced by combining carbon with nickel which contains practically no silicon, i. e., less than about 0.1% silicon. I may produce the new carbonized nickel from nickel such as electrolytic nickel, which is originally free from silicon, by carrying out the carbonizing treatment under conditions such that no silicon is introduced with the carbon; or I can use nickel which contains silicon by first removing the silicon before the carbon is added, and by then incorporating the carbon under such conditions that the introduction of silicon is avoided.

In producing the new carbonized material I may, for example, melt electrolytic nickel and treat it with carbon which is free or substantially free from silicon, such as charcoal, carrying out the process in an apparatus having a lining which is likewise free from silicon, for example, in an apparatus lined with magnesite. The amount of carbon incorporated with the nickel may vary and may be as high as 1 or 2% or more, or or even less than 1%, for example, ½ or ¾ of 1%.

Where the nickel contains silicon I may free it from silicon by subjecting it to a blowing operation with air until the silicon is oxidized, and removing the silica in the form of a slag, and then adding the carbon to the desiliconized nickel until the desired absorption of carbon thereby has taken place. The freeing of the nickel from silicon should of course be carried out in apparatus which does not introduce further amounts of silicon into the molten nickel. That is, the nickel should be melted in a furnace which does not contain silica in its lining.

When nickel is smelted in furnaces having a lining of chrome brick, small amounts of chromium may also be introduced into the nickel. This chromium is also objectionable for many purposes but it can be readily removed in the same manner and at the same time as the silicon by subjecting the nickel to a blowing operation and slagging off the oxidized chromium and silica. The resulting nickel, free from chromium and silicon, can then be carbonized in the manner above described.

The new carbonized nickel of the present invention is particularly advantageous for many purposes. It can be cast in metal molds without producing cast articles of objectionable hardness; whereas carbonized nickel which contains silicon cannot be cast in metal molds without imparting a degree of hardness to the article which is objectionable for certain purposes. The new alloy accordingly can be used for purposes where carbonized nickel containing silicon, or containing silicon and chromium are objectionable.

In referring to the new alloy as free or

practically free from silicon, I mean that the amount of silicon does not exceed about 0.1%.

I claim:

1. Carbonized nickel which is practically free from silicon.

2. Carbonized nickel which is practically free from silicon and chromium.

3. Carbonized nickel which is practically free from silicon and which can be cast in metal molds without imparting objectionable hardness to the cast article.

4. Carbonized nickel which is practically free from silicon and which contains from about ½ of 1% to about 2% carbon.

In testimony whereof I affix my signature.

NOAK VICTOR HYBINETTE.