

UNITED STATES PATENT OFFICE

2,422,948

FERROUS ALLOY

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1 Claim. (Cl. 75-128)

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This invention relates generally to ferrous alloys, but has reference more particularly to alloys which are especially adapted for hard facing purposes, but which can also be used in the form of castings.

In our U. S. Patent No. 2,208,117, there is described a high-carbon ferrous alloy, containing substantial amounts of chromium, molybdenum and nickel, such alloy being particularly useful hard facing applications, requiring resistance to abrasion.

We have discovered that by utilizing only a portion of the nickel and chromium ranges of the aforesaid alloy and adding silicon to the alloy in a certain predetermined relation to the nickel, the aforesaid patented alloy, which is normally austenitic, can be converted to the ferritic condition, in which condition, it is tough, hard, magnetic, has a microstructure which is characterized by a good carbide distribution, can be welded without cracking, and has a coefficient of expansion similar to that of ordinary steel.

The improved alloy contains from about 3% to about 5% carbon, from about 2% to about 10% nickel, from about 8% to about 22% chromium, from about 6% to about 12% molybdenum, and from about 2.25% to about 5.5% silicon, the balance of the alloy being substantially all iron.

The ferritic condition is maintained by preserving a ratio of the silicon to nickel in accordance with the following schedule:

Nickel	Silicon
Percent	Percent
2-4	2.25-5.5
4-7	3.50-5.5
7-10	4.00-5.5

In other words, when the nickel content of the alloy is between 2% and 4%, a minimum of 2.25%

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silicon is used in the alloy, when the nickel content is between 4% and 7%, a minimum of 3.50% silicon is used, and when the nickel content is between 7% and 10%, a minimum of 4% silicon is used.

While the usefulness of the alloy for hard facing purposes has been emphasized, it is to be understood that the alloy may also be utilized for making castings.

Having thus described our invention, we claim: A ferrous alloy containing from about 3% to about 5% carbon, from about 2% to about 10% nickel, from about 8% to about 22% chromium, from about 6% to about 12% molybdenum, and from about 2.25% to about 5.5% silicon, in accordance with the following schedule:

Nickel	Silicon
Percent	Percent
2-4	2.25-5.5
4-7	3.50-5.5
7-10	4.00-5.5

the remainder of the alloy being substantially all iron, and the silicon being present in an amount which renders the metal in the "as-cast" state no longer austenitic but ferritic.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,292,741	Cape	Aug. 11, 1942
2,208,118	Cape	July 16, 1940
2,256,137	Cape	Sept. 16, 1941