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SELF-HARDENING ALLOYS

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This invention relates generally to alloys, but has reference more particularly to alloys of the self-hardening type.

A primary object of the invention is to provide a self-hardening alloy or material which possesses extraordinary toughness in the as welded or as cast condition, but which hardens under impact while still maintaining its toughness.

Alloys, in accordance with the invention, consist of the following ingredients, in the proportions stated:

	Range	Preferred Alloy
Carbon.....	1-4.25	2.5
Silicon.....	1-4	2.0
Manganese.....	4-8	6
Chromium.....	10-30	15
Iron.....	Balance	Balance

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In connection with the foregoing range, it is desirable that the higher the manganese, the higher should be the silicon. For example, when the silicon is 1-3%, the manganese should be 4-7%, and when the silicon is 2-4%, the manganese should be 5-8%. When this proportional relationship is adhered to, i. e., increasing the manganese as the silicon is increased, the alloy becomes non-magnetic.

The alloys, in the as welded condition, have a Rockwell C hardness of 30-45, and the hardness increases to over 50, on peening.

It is to be understood that the expression "the remainder being substantially iron," as used in the claims, is to be construed as including any other ingredients or impurities in relatively small or trace amounts, which are found associated with the various constituents of the alloy.

Having thus described our invention, we claim:

1. A self-hardening alloy consisting of from about 1% to about 4.25% carbon, from about 1% to about 4% silicon, from about 4% to about 8% manganese, and from about 10% to about 30% chromium, the remainder being substantially iron, and the silicon and manganese being maintained at all times in such proportional relationship that the alloy is non-magnetic, said alloy having a Rockwell C hardness, in the as-welded condition, of 30 to 45.

2. A self-hardening alloy, as defined in claim 1, in which, when the silicon content is in the range of 1 to 3%, the manganese content is from 4 to 7%, and when the silicon content is in the range of 2 to 4%, the manganese content is from 5 to 8%.

References Cited in the file of this patent

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