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STRUCTURAL ELEMENT

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3 Claims. (Cl. 75—171)

This invention relates generally to alloys, but has reference more particularly to alloys which are especially adapted for hard facing purposes as well as for use in the form of castings.

A primary object of the invention is to provide an alloy which is especially useful for hard facing valves and valve seats, but which is useful for other applications in which abrasion and wear at relatively high temperatures is encountered.

Another object of the invention is to provide an alloy of the character described which is particularly resistant to the attack of lead oxide and other lead compounds found in or resulting from the combustion of so-called leaded gasoline.

Other objects and advantages will be apparent during the course of the following description.

An alloy, in accordance with the invention, may contain the following constituents or elements in the stated ranges:

	Percent
Nickel	35 to 55
Chromium	25 to 40
Tungsten	10 to 20
Cobalt	up to 12
Carbon	up to 3.5
Iron	Balance but not more than 15

A primary consideration is that the nickel content in all cases exceed the chromium content of the alloy.

The carbon may be replaced in whole, or in part, by an equivalent or substantially equivalent amount of boron, for the purpose of controlling the hardness of the alloy. In most cases, however, a carbon content of from about 1.75% to 2.75% is preferred, a particularly desirable hardness of the alloy being attained within this carbon range.

While the balance of the alloy is stated to be iron in amounts up to about 15%, it is preferred to maintain the iron content below 6%.

A preferred alloy within the range stated above has the following approximate analysis:

	Percent
Nickel	40
Chromium	32.5
Tungsten	15
Cobalt	10
Carbon	2.5
	100.0

An alloy of this analysis has a hardness of from about 43 to about 45 Rockwell C scale, and this hardness is maintained even if the carbon content is varied within a range of from about 2% to about 2.75%.

Alloys made in accordance with the invention are particularly resistant to the attack of lead oxide and other lead compounds found in or resulting from the combustion of the so-called leaded gasolines, and for this reason are especially adapted for the hard-facing of valves and valve seats in internal combustion engines which utilize such fuels.

While the utility 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 my invention, I claim:

1. A structural element having at least a part which in use is subjected to abrasion and wear at elevated temperatures, and which is capable of resisting the corrosive action of lead oxide at those temperatures, said part comprising an alloy containing from about 35% to about 55% nickel, from about 25% to about 40% chromium, from about 10% to about 20% tungsten, cobalt in appreciable amounts up to about 12%, and carbon in appreciable amounts up to about 3.5%, the balance of the alloy being substantially all iron, but the iron content in no case being more than 15% of the alloy, and the nickel content in all cases being in excess of the chromium content.

2. A structural element, as defined in claim 1, in which the carbon is within the range of from about 1.75% to about 2.75%.

3. A structural element, as defined in claim 1, said element being a valve.

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