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ALLOY COMPOSITIONS

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This invention relates, as indicated, to alloy compositions, but has reference more particularly to compositions which are especially useful for hard facing.

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

	Range	Preferred Range	Preferred Alloy
Cobalt.....	30-50	32-37	35
Nickel.....	30-50	34.5-38.5	36.5
Silicon.....	2.5-5.5	3.5-5.25	5
Iron.....	15-25	18-22	20
Boron.....	2-4	2.5-3.75	3.5
			100.00

The compositions are essentially of the low carbon type containing carbon in such amounts as happen to be present in the iron, but not more than 1% as a maximum.

The cobalt and iron should always be present in a combined percentage of more than 50%.

Alloys made in accordance with the invention are especially valuable for the hard facing of various articles subjected to heat, wear and corrosion, and particularly for facing internal combustion engine valves. The alloys have

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excellent resistance to lead oxide corrosion, and have excellent oxidation resistance up to the softening point of the alloys. The alloys have relatively low melting points (1875° F.-2125° F.), and have excellent flow characteristics, and are therefore easily applied, flowing in a desired manner during application.

The alloys are extremely tough, and have a hardness range, in a welded section, which varies from about 450 Knoop on the low side of the above range to about 900 Knoop at the high side of the range.

The alloys may be used in the form of weld rods, powder, castings, etc., and are also suitable for brazing steels, stainless steels, high alloys, etc.

It is to be understood that the expression "the remainder being substantially all iron," as used in the claims, is to be construed as including carbon in amounts not more than about 1%, but preferably under 0.1%, and 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. Alloy compositions which are especially adapted for hard facing, said compositions consisting of cobalt in amounts of from about 30% to about 50%, boron in amounts of from about 2% to about 4%, nickel in amounts of from about 30% to about 50%, and silicon in amounts of from about 2.5% to about 5.5%, the remainder being substantially all iron, and the cobalt and iron being present in a combined amount greater than 50%.

2. An alloy composition which is especially adapted for hard facing, said composition consisting of about 35% cobalt, about 3.5% boron, about 36.5% nickel, about 5% silicon, and about 20% iron.

References Cited in the file of this patent

UNITED STATES PATENTS

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