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ALLOY.

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The present invention relates to alloys and more especially to oxidation or corrosion resisting cast iron alloys. We have discovered that if nickel and chromium be added as alloying metals to gray cast iron, an alloy is produced which can be cast and handled in the foundry substantially the same as ordinary gray cast iron. Its shrinkage, while a bit higher than ordinary cast iron, is nevertheless comparable to it and is such that it does not prevent good castings. In making the alloy, cast iron having the usual carbon content for cast iron, say of 2% to 4% carbon, has added to it nickel in amounts from 5% to 35% and chromium from 2% to 15%. If desired, aluminum and maganese may be added in amounts from .3% to 10% manganese, and from nothing up to 3% aluminum. Silicon in amounts from 1% to 3% is generally present.

Typical analyses of such alloys are as follows:

Ni	Cr	Mn	Al	Si	C
30	3	1/2	0	1-3	2-4
20	5	1/2	0-1	2-3	2-3½
25	8	1/2	0-3	2-3	2-3½
15	5	1/2	0-3	1-3	2-4

The alloy may be cast in sand molds to form a gray cast iron, or it may be cast against a chill to form white iron. As above stated, the shrinkage of such castings is about the same as ordinary cast iron. When the alloy is cast under the usual conditions of making gray iron castings, the carbon is partly in the graphitic state so that the castings are gray and readily machinable. The hardness of such castings is from 75 to 175 Brinnell. The transverse strength measured on the usual test bar 1¼ inches round and 12 inches long between supports is from 2,500 to 4,000 pounds.

The castings made from these alloys have a remarkable resistance to rusting, corrosion and the action of acids. The corrosion of a typical casting in 5% sulphuric acid was found to be 536 milligrams per square decimeter per day. The alloy is also highly resistant to oxidation and scaling at high temperatures. The castings are also subject to heat treatment, rendering them within suitable composition limits, either soft or hard with corresponding variations in malleability and toughness.

The alloy is particularly adapted for castings either gray iron or chilled castings where corrosion resistant castings are required, such as for valves, chemical apparatus, etc.

This alloy is readily welded giving a good weld free from the usual hard spots characterizing cast iron welds. This quality is of considerable importance since defective castings may be readily repaired.

Castings made from this alloy have relatively low magnetic permeability and high electrical resistivity. These qualities make the alloy highly desirable for use in castings to be used in connection with electrical machinery.

While we have specifically described the preferred embodiments of our invention it is to be understood that the invention is not so limited but that it may be otherwise embodied within the scope of the following claims.

We claim:

1. As a new article of manufacture, a corrosion resistant cast iron containing carbon within the usual ranges for cast iron and containing nickel from 5% to 35% and chromium from 2% to 15%, nickel being present in greater percentage than the chromium substantially as described.

2. As a new article of manufacture, a corrosion resistant cast iron containing from 2% to 4% carbon, nickel from 5% to 35%, and chromium from 2% to 15% nickel being present in greater percentage than the chromium, substantially as described.

3. As a new article of manufacture, a corrosion resistant cast iron containing from 2% to 4% carbon, nickel from 5% to 35%, chromium from 2% to 15% nickel being present in greater percentage than the chromium, manganese up to 10% and aluminum up to 3%, substantially as described.

4. As a new article of manufacture, a corrosion resistant cast iron containing from 2% to 4% carbon, chromium from 2% to 15%, and nickel from 10% to 35%.

5. As a new article of manufacture, a corrosion resistant gray cast iron containing the usual carbon content of cast iron, nickel from 5% to 35%, chromium from 2% to 15%, the nickel content being at least equal to the chromium content.

In testimony whereof we have hereunto set our hands.

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