

UNITED STATES PATENT OFFICE

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CORROSION RESISTANT ALLOY

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My invention relates to corrosion-resistant chromium-nickel-molybdenum-iron alloys having an addition of antimony. These alloys are remarkable for very high resistance to corrosion. For example, their resistance to caustic soda solution or caustic potash solution and especially to hydrochloric acid is far superior to that of the usual chromium-nickel-molybdenum-iron alloys, for example of the known austenitic chromium-nickel-molybdenum steels. The new alloys may be further improved by an addition of copper.

In my co-pending application for Letters Patent, Serial Number 28,943, filed June 28, 1935, which matured into Patent No. 2,054,927 on Sept. 22, 1936, I have already suggested alloys of the following composition:

|                                                     | Percent |
|-----------------------------------------------------|---------|
| Carbon.....                                         | 0.-1.   |
| Chromium.....                                       | 10.-25. |
| Nickel.....                                         | 20.-40. |
| Molybdenum.....                                     | 1.-10.  |
| Antimony.....                                       | 2.-7.   |
| Copper.....                                         | 0.-10.  |
| Balance iron with or without the normal impurities. |         |

I have now found that the above-mentioned high resistance to corrosion of these alloys is also obtained already with antimony contents of 0.5 to 2%. So, for example, an alloy containing

|               | Percent |
|---------------|---------|
| Carbon.....   | 0.04    |
| Chromium..... | 13.     |
| Nickel.....   | 30.     |

|                                        | Percent |
|----------------------------------------|---------|
| Molybdenum.....                        | 5.      |
| Copper.....                            | 5.      |
| Antimony.....                          | 1.5     |
| Balance iron with the usual impurities |         |

has been tested in 25.% hydrochloric acid solution at a temperature of 80° centigrade. The loss in weight occurring by this treatment amounted only to from 1 to 2 grammes per sq. meter per hour.

Preferably I use alloys of the following composition:

|                                                     | Percent  |
|-----------------------------------------------------|----------|
| Carbon.....                                         | 0.02-0.2 |
| Chromium.....                                       | 10.-20.  |
| Nickel.....                                         | 27.-33.  |
| Molybdenum.....                                     | 2.-5.    |
| Copper.....                                         | 2.-6.    |
| Antimony.....                                       | 0.5-2.   |
| Balance iron with or without the normal impurities. |          |

What I claim and desire to secure by Letters Patent is:—

1. A chromium-nickel-iron alloy containing 0.02-1.% carbon, 10.-25.% chromium, 20.-40.% nickel, 1.-10.% molybdenum, 0.5 to less than 2% antimony, 0.1-10% copper, balance iron with or without the normal impurities.

2. A chromium-nickel-iron alloy containing 0.02-0.2% carbon, 10.-20.% chromium, 27.-33.% nickel, 2.-5.% molybdenum, 2.-6.% copper, 0.5 to less than 2% antimony, balance iron with or without the normal impurities.

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