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STEELS AND ALLOYS HAVING ELEVATED CHROMIUM CONTENT

Emanuel Valenta, Pilsen, Czechoslovakia, assignor, by mesne assignments, to Electro-Metallurgical Company, New York, N. Y., a corporation of West Virginia

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Steels and alloys having essentially a content of 5–30% of chromium and 0–3% of carbon are characterised by high resistivity towards heat and corrosion, which in many cases is not attainable with any other composition of steels and alloys of this type. Their applicability in practice, however, is very much limited by the grain coarseness which appears more particularly in the case of cast pieces, this grain coarseness resulting in a reduction of all mechanical strength values, in the case of temperature changes, for example during welding, giving rise to the ready formation of cracks.

These great disadvantages are avoided according to the invention by adding to the steels and alloys of this type 0.05–0.5% of nitrogen together with 0.05–0.5% of titanium in any combination, if desired with addition also of zirconium in quantities of 0.05–0.5%. The common addition of titanium and nitrogen, with in certain cases the simultaneous presence of zirconium as well, has a considerable influence on making the texture finer than has been obtained by mere presence of titanium or nitrogen alone. The texture improvement is shown by a substantial increase in the mechanical strength values, more particularly in the case of the bending strength, and in the stability during temperature changes; it prevents, for example, the appearance of cracks in the proximity of welds. Very good results have been obtained, more particularly in the case of a content of 0.35% of carbon, but an extensive improvement is also obtained in the case of higher carbon contents.

This influence is particularly apparent in the case of alloys and steels which contain further additional elements, such as for example silicon, aluminium, copper, nickel and the like, individually or in any desired combinations up to 5%.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. An alloy containing 5 to 30% chromium, an effective amount to 3% carbon, 0.05 to 0.5% nitrogen, 0.05 to 0.5% titanium and the remainder iron.

2. An alloy as defined in claim 1, wherein the carbon content does not exceed 0.35%.

EMANUEL VALENTA.