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STEEL ALLOY.

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The invention relates to steel alloys adapted to be used in manufacturing articles which are hardened in their marginal layers by nitrogenization, as for example by the process described in my Patent No. 1,487,554 and has for its object to produce steel alloys of a nature such as to cause the articles made of them to acquire in their marginal layers an extraordinarily high hardness by said nitrogenization, and to be distinguished by particularly good properties of strength as to their core-zone (in particular tenacity and insensibility to tempering brittleness).

This object is attained, according to the present invention, by the fact that the steel alloys contain 0,5 to 2% of aluminium and, either separately or in any desired combination, 0,5 to 4% of silicon, manganese, nickel, chromium, molybdenum, tungsten, vanadium, titanium or zirconium and up to 0,6% of carbon.

Steel alloys have already been proposed for the manufacture of articles which are hardened in their marginal layers by nitrogenization at a temperature of less than 580° C., said steel alloys containing, either separately or in any desired combination, aluminium, chromium, manganese or silicon. This proposal, however, does not yet realize the above-mentioned problem viz, to produce such articles which are to present, at the same time, a particularly increased hardness of their marginal layers and extraordinarily good properties of strength of their core-zone (in particular tenacity and insensibility to tempering brittleness).

The hardness of the marginal zone and the said properties of strength will increase up to extraordinarily advantageous values if the articles are made of steel alloys containing 0,5 to 2% of aluminium and 0,5 to 3% of chromium.

Claims:

1. An article having nitrogen in its marginal layers and consisting of a steel alloy containing 0.5 to 2% of aluminium, up to 0.6% of carbon, 0.5 to 4% of an element having the properties of chromium.

2. An article having nitrogen in its marginal layers and consisting of a steel alloy containing 0.5 to 2% of aluminium, up to 0.6% of carbon, 0.5 to 4% of a combination of elements having the properties of chromium.

3. An article having nitrogen in its marginal layers and consisting of a steel alloy containing 0.5 to 2% of aluminium, up to 6% of carbon, 0.5 to 4% chromium.

4. An article hardened in its marginal layer by nitrogenization consisting of an alloy containing 0.5 to 2% of aluminium, up to 0.6% of carbon, 0.5 to 4% of an element having the properties of chromium, and the principal portion of the remainder iron.

5. An article hardened in its marginal layer by nitrogenization consisting of an alloy containing 0.5 to 2% of aluminium, up to 0.6% of carbon, 0.5 to 4% of a combination of elements having the properties of chromium, and the principal portion of the remainder iron.

6. An article hardened in its marginal layer by nitrogenization consisting of an alloy containing 0.5 to 2% of aluminium, up to 0.6% of carbon, 0.5 to 4% of chromium, and the principal portion of the remainder iron.

The foregoing specification signed at Cologne, Germany, this 13th day of August, 1925.

ADOLF FRY.