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MAGNESIUM ALLOYS

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The present invention relates to the production of magnesium alloys and has for its object to provide a magnesium alloy which is sufficiently resistant against corrosion and has a hardness permitting the alloy to be used for industrial purposes.

Repeated but unsuccessful attempts have hitherto been made to produce magnesium alloys having the above mentioned properties. To raise the hardness of such alloys it has already been proposed to use magnesium alloys containing silicium and relatively high percentages of aluminium and containing furthermore the metals stibium, nickel, chromium, manganese and molybdenum as hardening agents. To reduce their brittleness these alloys must further contain copper and titanium.

Thus the aforementioned alloys are composed of ten components, a fact that makes the production of homogenous melts very difficult due to the fact that the components separate from the melts when they are cooled.

Experience in practice has shown that in most cases it is quite impossible to obtain homogenous alloys with the components enumerated above and that the magnesium content should not substantially exceed 60% if a sufficient Brinell hardness of about 100 is to be obtained.

The object of the present invention, therefore is to provide a magnesium alloy with a much simpler composition, which in spite of its high magnesium contents shows a Brinell hardness of 100–125 although it does not contain the components silicon, stibium, nickel, chromium, molybdenum and titanium.

The new alloy according to the present invention is characterised by the fact that it contains only magnesium, aluminium, copper, manganese, silver and either beryllium, iridium or tantalum in the proportions of 70–80% Mg, 10–15% Al, 7–10% Cu, 1–2% Mn and 2–3% Ag and 0.5–1% of beryllium, iridium or tantalum. The purpose of the beryllium, iridium and tantalum is to obtain an especially high Brinell hardness and 2–3% of iron, particularly grey cast iron, may be included for improving the machining, rolling and harding properties.

It is evident, that it is much easier to produce this alloy on a technical scale than the alloys mentioned above, due to the fact that the number of the components is not chosen higher than strictly necessary to obtain the desired effect, and that the silver has a compensating and homogenizing effect so as to avoid the separation of particular components when the alloy is cooled.

The following are some typical examples of alloys within the scope of the present invention:

I

	Per cent
Mg	75.1
Al	12.4
Cu	7.5
Mn	2.0
Ag	2.0
Be	1.0

II

	Per cent
Mg	75.2
Al	12.3
Cu	1.0
Mn	1.0
Cu	7.2
Be	0.6
Ag	2.5

III

	Per cent
Mg	72.2
Al	12.2
Cu	7.7
Mn	1.9
Ag	2.5
Be	1.0
Fe	2.5

These alloys have a specific weight of between 1.9 and 2.1 and a small coefficient of expansion, good sliding properties and a good heat-conductivity.

All these properties make these alloys particularly suitable for the use in the construction of internal combusting engines and more especially for the construction of pistons. The alloys may further be used for making pickers for looms and replacing the usual raw hide pickers.

The iron containing alloys are somewhat softer but can be machined rolled and bent.

I claim:

1. A corrosion-resistant alloy having a Brinell hardness of about 100 or higher consisting essentially of about 10 to 15% aluminium, about 7 to 10% manganese, about 2 to 3% silver as a homogenizer during cooling, about 0.5 to 1% of a metal of the group consisting of beryllium, iridium and tantalum, and substantially all of the balance being magnesium, said alloy being substantially free of silicon, stibium, nickel, chromium, molybednum and titanium.

2. A homogeneous alloy which has a Brinell hardness of about 100 or higher, a specific weight of between about 1.9 and 2.1, a low coefficient of expansion, low coefficient of friction and high heat conductivity consisting of about 10 to 15% aluminium, about 7 to 10% manganese, about 0.5 to 1% of a metal of the group consisting of beryllium, iridium and tantalum, about 2 to 3% silver as a homogenizer, and substantially all of the balance being magnesium.

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