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MAGNESIUM ALLOYS

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4 Claims. (Cl. 75—168)

The invention relates to the production of magnesium alloys.

The magnesium alloys hitherto known for die-casting do not exhibit a sufficient tensile strength and are also defective in respect of adequate ductility, so that the possible uses to which these alloys can be put are seriously limited.

The object of the present invention is to provide an improved magnesium alloy in which these defects do not appear.

According to the present invention this object is attained by an alloy of magnesium with from 3 to 14% of the pre-alloy or master-batch alloy forming the subject of my co-pending application for which I have executed documents simultaneously with the present documents, which pre-alloy consists of:

	Per cent
(1) Aluminium	44 –30
(2) Zinc	24.5–41
(3) Manganese	2 – 4
(4) Nickel	3.5– 8
(5) Magnesium	26 –17

The alloy according to the invention thus has a composition falling within the following limits:

	Per cent
(1) Aluminium	0.90 – 6.16
(2) Zinc	0.735– 5.74
(3) Manganese	0.06 – 0.56
(4) Nickel	0.105– 1.12
(5) Magnesium	88.98 –97.78

For producing an alloy within the foregoing range which after being die cast exhibits high tensile strength and average ductility, the composition may be as follows:

	Per cent
(1) Aluminium	5
(2) Zinc	3
(3) Manganese	0.3
(4) Nickel	1
(5) Magnesium	90.7

An alloy which when die cast has average tensile strength with very high ductility has the following composition:

	Per cent
(1) Aluminium	4
(2) Zinc	5
(3) Manganese	0.2
(4) Nickel	0.5
(5) Magnesium	90.3

An alloy for die casting which exhibits both high tensile strength and high ductility as well as great toughness is obtained by selecting the following composition:

	Per cent
(1) Aluminium	5.5
(2) Zinc	4
(3) Manganese	0.5
(4) Nickel	0.3
(5) Magnesium	89.7

In all cases, the alloys are produced in the following way: First of all an alloy as prescribed in the copending application hereinbefore referred to is produced with the requisite quantities of aluminium, zinc, manganese and nickel, and the appropriate amount of magnesium as specified in the said application. Pigs of this pre-alloy are placed in the furnace and are covered with a covering salt of known composition which comprises magnesium chloride. When the material has liquefied, pig magnesium is added to the requisite amount and a fresh covering of salt is applied. After a temperature of about 950° C. has been reached heating is discontinued and the liquid metal which is somewhat superheated is thoroughly stirred and is covered again. After the temperature has dropped to about 800° C. the slag is removed and the alloy is cast in moulds of the desired dimensions at about 700° C.

I claim:

1. As an article of new manufacture, a magnesium alloy having a composition falling within the range:

	Per cent
(1) Aluminium	0.90 – 6.16
(2) Zinc	0.735– 5.74
(3) Manganese	0.06 – 0.56
(4) Nickel	0.105– 1.12
(5) Magnesium	88.98 –97.78

2. As an article of new manufacture, an alloy consisting of:

	Per cent
(1) Aluminium	5
(2) Zinc	3
(3) Manganese	0.3
(4) Nickel	1
(5) Magnesium	90.7

3. As an article of new manufacture, an alloy consisting of:

	Per cent
(1) Aluminium	4
(2) Zinc	5
(3) Manganese	0.2
(4) Nickel	0.5
(5) Magnesium	90.3

4. As an article of new manufacture, an alloy consisting of:

	Per cent
(1) Aluminium	5.5
(2) Zinc	4
(3) Manganese	0.5
(4) Nickel	0.3
(5) Magnesium	89.7

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