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COPPER ALLOY FOR CHILL AND DIE CASTING

Eugen Vaders, Eberswalde, Germany

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1 Claim. (Cl. 75—1)

My invention relates to a copper alloy for chill and die casting. It is an object of my invention to improve an alloy of this type, and to this end I admix silicon thereto.

Chill and die castings are manufactured to a limited extent only, and by preference of copper-zinc alloys, aluminium brass and aluminium bronze. The latter is recommended for chill casting while for die casting brasses with a comparatively high percentage of zinc are preferred.

Chill castings of aluminium bronze are liable to the formation of a skin of aluminium oxide which detracts from the appearance of the castings, and sometimes make them unsuitable altogether.

Another drawback of aluminium bronze is the high shrinkage. Castings having recesses and cavities often become welded at the cores so that it is difficult or even impossible to extract the cores. When a core sticks the alloy must be melted in the permanent mould which is very detrimental to the mould.

Die castings of brass lack strength and their faces are rough on account of the zinc vapour formation. Parts undergoing high stress, such as gear wheels, cams, bearing brasses, etc., cannot be die cast from brass as the brass does not possess the properties required for such parts.

On the other hand, copper-silicon alloys are equally suitable for chill and for die casting. The favorable influence of silicon is two-fold. First-

ly, it improves the mechanical properties of the castings and gives them a perfectly smooth surface, due to the formation of silicon dioxide. A surface of such smoothness will not be attained with any of the existing alloys. Secondly, silicon is a good deoxidizing agent so that the castings are free from slag, which further improves the surface.

Preferably, zinc is added to the copper-silicon alloy, as the mechanical properties are much improved by such addition.

A suitable alloy has the following composition:

	Percent
Copper.....	65 to 94
Silicon.....	6 to 2
Zinc.....	28 to 3

If it is desired that the alloy should have particular properties, for instance, should be suitable as a bearing metal, other metals are added but not exceeding 2%.

Such metals are: lead, antimony, bismuth, cadmium, tin, nickel, cobalt, manganese, iron, chromium, aluminium, titanium, tungsten, molybdenum, zircon.

I claim:

A chill or die casting of an alloy consisting of from 65% and up to 94% copper, from 2% to 6% silicon, from 3% to 28% zinc, and an appreciable amount of aluminum not more than 2%.

EUGEN VADERS.