UNITED STATES PATENT OFFICE.

WALTER RÜBEL, OF VIENNA, AUSTRIA-HUNGARY.

METHOD OF PRODUCING COPPER-ZINC COMPOSITIONS AND ALLOY FOR THE PRODUCTION THEREOF.

952,585. Specification of Letters Patent. Patented Mar. 22, 1910.

No Drawing. Application filed July 9, 1909. Serial No. 506,783.

To all whom it may concern:

Be it known that I, WALTER RÜBEL, a citizen of the Empir of Germany, residing at Vienna, in the Empire of Austria-Hungary, have invented a new and useful Method of Producing Copper-Zinc Compositions and Alloys for the Production Thereof, of which the following is a specification.

Heretofore copper-zinc compositions have been produced by melting with copper and zinc a small quantity of alloy consisting of copper, iron, nickel and aluminum. The composition so produced possesses valuable properties, but it is not suitable for many purposes because of its low density, which renders it permeable to water under very high pressure. Such brass can be satisfactorily cast in bars, but it is not practicable to produce satisfactory castings for delicate working pieces and bodies, such as are required in valves and the like.

This invention relates to an improvement in the method of producing copper-zinc compositions and in the alloy used for the purpose by which these defects are overcome.

In carrying out my invention I employ an alloy which contains, in addition to the copper, iron and aluminum, a quantity of manganese, either with or without nickel. The manganese increases the tensile strength and the elastic limit. When nickel is used, it is in a considerably increased percentage and raises the limit of elasticity. In case where a greater tensile strength and a higher limit of elasticity are required, both manganese and an increased percentage of nickel are employed. If higher tensile strength and high elastic limit are required, the nickel may be omitted and the percentage of manganese may be increased. When nickel is employed the alloy consists of 2 atomic weights of copper, 2 atomic weights of iron, 3 atomic weights of nickel, 1 atomic weight of manganese and 1 atomic weight of aluminum. These may be melted together in any known way. When nickel is omitted the percentage of manganese is increased to 3 atomic weights. The two alloys will thus correspond to the following formulæ:

(1) $Cu_2Fe_2Ni_3MnAl$;
(2) $Cu_2Fe_2Mn_3Al$.

The manganese may be added to the composition in the form of ferromanganese, but care must be taken that the proportions of iron and manganese shall be as represented in the above formulæ. To produce the composition up to ten per cent. (by weight of the whole mix) of either of these alloys is added to the copper and zinc. For example, a composition, according to my invention, may consist of: 10 parts by weight of the alloy, 50 parts by weight of copper, 40 parts by weight of zinc, all being alloyed together in the usual known way.

The relative proportions of the copper and zinc forming the composition body to which the alloy is added may be varied.

The composition produced by this method possesses a tensile strength up to 60 kilograms per square millimeter.

What I claim is:

1. The method of producing copper-zinc compositions of increased tensile strength and elastic limit which consists in adding to a mixture of copper and zinc, an alloy containing copper, iron, manganese and aluminum in substantially the proportions specified to an amount up to ten per cent. of the whole mix.

2. The method of producing copper-zinc compositions of increased tensile strength and elastic limit which consists in adding to a mixture of copper and zinc, an alloy consisting of copper, iron, manganese, nickel and aluminum in substantially the proportions specified to an amount up to ten per cent. of the total mix.

3. The alloy for increasing the tensile strength and elastic limit of copper-zinc compositions which contains two atomic weight of copper, two atomic weights of iron, three atomic weights of manganese and one part of aluminum.

4. The alloy for increasing the tensile strength and elastic limit of copper-zinc compositions which consists of two atomic weights of copper, two atomic weights of iron, three atomic weights of nickel, and one atomic weight each of manganese and aluminum.

WALTER RÜBEL.

Witnesses:
ROBERT W. HEINGARTNER,
AUGUST FUGGER.