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# UNITED STATES PATENT OFFICE.

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## ALLOY AND METHOD OF ITS MANUFACTURE.

SPECIFICATION forming part of Letters Patent No. 766,085, dated July 26, 1904.

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*To all whom it may concern:*

Be it known that I, RICHARD BEAUCHAMP WHEATLEY, residing at No. 115 Hungerford road, Barnsbury, in the county of London, England, have invented a certain new and useful Improved Metallic Alloy and Process of Its Manufacture; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The alloy which forms the subject of this invention consists principally of copper and zinc, which are united in the proportions very nearly like those found in common brass, but with which other metals are associated in small proportions, with the effect of endowing the alloy with physical properties greatly superior to that of brass. Those properties include great tensile strength, very great ductility, enabling the metal to be spun and mechanically manipulated while cold with a considerable degree of deformation without fracture, a large capacity for resisting corrosion under atmospheric influence, and a beautiful ruddy gold-like color. To a considerable extent these properties are derived from the mere appropriate presence of the additional substances; but they are also to a large extent due to the period at which and method by which one special ingredient is introduced into the melting-pot and amalgamated with the other metals.

The alloy consists of about ninety-eight and one-half per cent. of copper and zinc, which are present roughly in the respective proportions of sixty and forty per cent., and the remaining one and one-half per cent. is made up of the following other metals, namely: tin, aluminium, iron, manganese, tungsten, and strontium, and it is to the two latter that I attribute the great virtue of my alloy, the strontium serving to cause the tungsten to be thoroughly incorporated with the mass of the alloy.

In order to explain how the alloy is produced, it will be convenient to state the proportions by giving the weights of other substances which are added to, say, twenty pounds of copper. The total quantity of zinc to be added is twelve and one-half pounds; but it is not all introduced at once. The other substances are copper-manganese alloy, four ounces, consisting of seventy-five per cent. of copper and twenty-five per cent. of manganese; ferro-tungsten alloy, two ounces, consisting of twenty-five per cent. of iron and seventy-five per cent. of tungsten; aluminium, one and one-half ounces; tin, two ounces; and sulfate of strontium, four ounces.

The sulfate of strontium is first blended with a portion of the zinc—about five pounds—in a separate crucible, and the resulting metal, which will contain about one and one-half ounces of strontium compound out of the four which were introduced, is reserved to be added finally to the other metals to produce my alloy. This zinc-strontium blend, which has such a beneficial action on my alloy, is effected by melting the zinc and then adding the sulfate of strontium, maintaining the metal in a state of fusion for about twenty to thirty minutes, and stirring thoroughly.

To produce the alloy, the several metals mentioned and in the proportions stated, with the exception of five pounds of the zinc and the sulfate of strontium, are added to the melting-pot in an order which may be varied without appreciable alteration of effect and fused and intimately mixed by stirring, after which the zinc-strontium blend is added and the whole again thoroughly stirred. The strontium, which in this way is caused to pervade the whole mass, enables the other metals, notably the tungsten, to enter into intimate association with the alloy and give a beautiful ruddy-gold color to a very homogeneous metal possessing the other fine qualities previously mentioned. The resulting alloy has a percentage composition approximately as follows, but the proportions may be somewhat varied without material effect, one of the critical features of this invention consisting in effecting a homogeneous mass by the addition at the last stage of the mixing of a blending compound of zinc and strontium: approximate percentage composition of alloy, copper, 60.8; zinc, 37.6; manganese, .2; iron, .1; tungsten, .3; aluminium, .3; tin, .4; strontium, .3; total, one hundred.

I claim—

1. An alloy consisting of about ninety-eight and one-half per cent. of copper and zinc which are present approximately in the proportions of sixty and forty per cent. respectively and about one and one-half per cent. of other metals, consisting of manganese, iron, tungsten, aluminium, tin and strontium about one-third of which consists of tungsten and strontium in equal quantities.

2. An alloy consisting of about ninety-eight and one-half per cent. of copper and zinc which are present approximately in the proportions of sixty and forty per cent. respectively and about one and one-half per cent. of other metals, consisting of about .2 of manganese, .1 of iron, .3 of tungsten, .3 of aluminium, .4 of tin and .3 of strontium.

3. A process for producing an alloy consisting of about ninety-eight and one-half per cent. of copper and zinc which are present approximately in the proportion of sixty and forty per cent. respectively, and about one and one-half per cent. of other metals containing tungsten and strontium in which a blend of the strontium and some of the zinc, which has previously been separately formed, is at the last stage of the mixing, added to the other molten metals which compose the alloy.

4. A process for producing an alloy by intermixing the following metallic substances in the following proportions and order, first to about one hundred and sixty parts of zinc in the molten state eight parts of sulfate of strontium are added, second to about six hundred and forty parts of copper and about two hundred and forty parts of zinc in the molten state eight parts of an alloy of copper and manganese containing six parts of the former and two of the latter, four parts of an alloy of iron and tungsten containing one part of the former and three parts of the latter, three parts of aluminium and four parts of tin are added, third the product of the first mixing is added to that of the second mixing while the latter is in the molten state.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

RICHARD BEAUCHAMP WHEATLEY.

Witnesses:

ROBT. A. BLAKE,

W. M. HARRIS.