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ALLOY

Henry L. Whitman, Los Angeles, Calif.

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This invention relates to an improved alloy which is useful as a metal for manufacturing purposes and which takes a high finish and is very resistant to corrosion and which is especially useful as an ingredient to assist in the alloying of copper and lead, or copper, lead and tin, or copper and tin, because when it is used with those elements they become thoroughly joined and alloyed together and will not separate out on melting of the alloy.

The object of this invention is to provide such an alloy having the useful properties as a metal itself and having useful properties as an ingredient in other alloys.

In making this alloy I proceed with the following steps or stages.

First stage.—Melt together 65.188% copper and 31.426% nickel. (If the standard alloy, 50% copper, 50% nickel, is used instead of straight copper and straight nickel, the 50% copper in the already combined copper-nickel is deducted from the original amount of copper as given in the analysis). That is to say, enough copper should be added to make the right proportion.

Second stage.—As soon as the copper and nickel of the first stage are in molten state and thoroughly fused, I add 1.962% manganese and .491% iron and thoroughly incorporate them into the molten mass. Should ferro-manganese be used (80% manganese, 20% iron) instead of the straight iron and manganese, the percentages of iron and manganese used must agree with the exact percentages as given above. This is accomplished by adding to the ferro-manganese the necessary manganese to make the percentage called for.

Third stage.—When the copper, nickel, manganese and iron are all thoroughly melted and well mixed together, add .422% phosphorus. If phosphor-copper is used then the percentage of such phosphor-copper must be taken into consideration and the proportion of copper and phosphorus be maintained as given in the percentages in the analysis of this bronze. These materials in this proportion give the desired results and a fourth stage may be employed.

Fourth stage.—To the entire mixture add .491% of the special aluminum alloy as described in my accompanying copending applica-

tion Ser. No. 98,076, filed Aug. 26, 1936. This aluminum alloy is made up as follows:

	Percent
Aluminum	88.23
Copper	5.31
Tin	2.65
Nickel	.88
Magnesium	.88
Manganese	1.66
Silver	.39
Total	100.00

Thoroughly stir and mix this into the metal, bring the temperature of the combined mass up to a minimum of 2500° Fahrenheit, cast into pigs and the result is my improved alloy.

My alloy is thus made up of the following materials in the following proportions:

	Parts
Copper	65.188
Nickel	31.426
Manganese	1.962
Phosphorus	.442
Iron	.491

.491 part of the aluminum alloy has been added to this in the manufacture.

I have found that it is possible to vary the proportions of the materials somewhat. Nickel may vary from 26 to 31.426%; manganese may vary from .491% to 2%; iron may vary from .491% to 1% and the phosphorus may vary from .442% to 5%. The aluminum alloy may be added in the manufacture not to exceed 1%, and the copper may vary with these percentages to make up a 100% total.

The alloy thus produced is a composition of matter and an article of manufacture constituting a new alloy, silver bright in color, hard and strong, which does not tarnish, which takes a smooth polished surface, which is acid and corrosion-resistant, which can be rolled, and which can be forged and cast freely without segregation and which possesses characteristics necessary for cheap and successful production of manufactured metal parts that must withstand corrosion and high pressures. My alloy has a similar structure and other qualities, when made to this exact analysis, as are found in other nickel alloys containing higher percentages of nickel.

My alloy may be used in making leaded bronze

and 3% to 10% of the alloy is, in such case, mixed with lead from 10% to 60% and copper to make up 100%. This results in an improved leaded bronze in which the copper and lead will not separate out on melting and re-casting.

My improved alloy may be used in connection with copper and tin, or copper, lead and tin bronzes with the same effect. If my alloy is added to a mixture of 81% copper, 13% lead and 2% tin and 4% of my alloy, the product compares very favorably with the standard mixture of 80% copper, 10% lead, and 10% tin. Other leaded bronzes and non-ferrous alloys may be made up with my alloy and can be re-melted and re-cast freely and often.

My alloy, used as an alloy of itself, for purposes other than that as a catalyzer, is used with nothing added to it or mixed with it. It can be melted, re-melted and re-cast into any

shape or form desired, as an acid resistant metal of high lustre, non-tarnishable, high tensile strength and great compressive strength. It can be used to compete with or as a substitute for high-nickel alloys and stainless steels.

I desire to claim the invention specifically and also broadly as pointed out in the appended claims.

Having thus described my invention, what I desire to claim as new and secure by Letters Patent is:

1. An alloy having therein nickel 26 to 31.426%, manganese .491 to 2%, iron .491 to 1%, phosphorus .442 to 5% and copper to substantially make up 100% of the composition of the alloy.

2. An alloy having therein copper 65.188%, nickel 31.426%, manganese 1.962%, phosphorus .442%, and iron .491%.

HENRY L. WHITMAN.