

1

3,424,577

METAL ALLOY COMPOSITION

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ABSTRACT OF THE DISCLOSURE

A non-tarnishing gold alloy by weight consists of 50-60% silver and copper; at least 3-6% palladium; and the balance gold. The palladium serves to minimize the tarnishing of the silver content of the alloy.

This invention relates to alloys and more particularly to alloys which include copper and silver as essential constituent metals in precious metal alloys, especially for use in cast or wrought dental work and for the manufacture of articles of jewelry, and industrial items such as electrical contacts.

Heretofore, the tarnishing of gold alloys and other alloys of a precious metal color was attributed to and was believed to be caused by the copper content of such alloys.

We have discovered that, contrary to prior belief, tarnishing of alloys of the above mentioned character results from the silver content and by reason of this discovery we have succeeded in the objective of our invention which is to provide an alloy of gold color or of other precious metal color which is non-tarnishing, or highly resistant to tarnishing, and which can be produced at decreased cost.

In accordance with our invention a non-tarnishing alloy of gold color is obtainable when the combined copper and silver content constitutes 55% of the alloy composition and when there is present at least 5% or more, preferably, 6% of palladium, the rest of the composition being gold which constitutes 40% of the composition when 5% of the composition is palladium and which constitutes 39% of the composition when the palladium content is 6%. We have found that at least 5% of palladium in the alloy having a combined copper and silver content of 55% is necessary to prevent an intolerable tarnishing of the gold color and that 6% of palladium or more in the alloy.

The ratio of silver to copper in the above mentioned combined silver and copper content of 55% is preferably 3 of silver to 2 of copper. With this ratio of silver to copper and with a gold content of 39%, the alloy has a pleasing color of light-yellow gold. If an alloy having a light color is desired, the percentage of palladium is increased corresponding to the decrease in the amount of gold. For example, when the combined copper and silver content is 60% and the palladium content is 6%, the gold content being 34%, the color of the gold alloy will be that of white gold.

Limited variations in the silver to copper ratio in the combined silver and copper content of 55% are permissible, for example, for 3 silver to 2 copper to reversed ratios ranging from 3 copper to 2 silver. However, the amount of palladium remains as above indicated, namely not less than 5%, even when the ratio of silver to copper is 2:3.

The preferred composition of the alloy of gold color is:

Palladium	6
Gold	39
Silver	33
Copper	22

A reduction in the combined silver and copper content

2

of an alloy of gold color to 50% is within the scope of this invention, the ratio of silver to copper varying from 3 silver to 2 copper to 2 silver to 3 copper as in the above combined silver and copper content of 55%. With such content of silver and copper, the minimum permissible quantity of palladium to prevent tarnishing is 3%, the maximum gold content being 47%. The following is a preferred composition when the combined silver and copper content is 50% and the silver to copper ratio is 3:2:

Palladium	4
Gold	46
Silver	30
Copper	20

As used in certain of the claims, hereinafter appended, the term "precious metal" is applicable to gold, palladium and platinum.

While we have shown and described the preferred embodiments of our invention, it will be understood that the invention may be embodied otherwise than as herein specifically illustrated or described, and that certain changes in the form and arrangement of parts and in the specific manner of practicing the invention may be made without departing from the underlying idea or principles of this invention within the scope of the appended claims.

What is claimed is:

1. A non-tarnishing metal alloy having a color of one of the group consisting of yellow, white and combinations thereof, consisting of 50 to 60 percent silver plus copper, 3 to 6 percent palladium and the balance gold, wherein the silver to copper content in weight percent varies from 3 to 2 through 2 to 3, and further characterized by having at 50 percent silver plus copper content a minimum palladium content of 3 percent and at 60 percent silver plus copper content a minimum palladium content of 5 percent and at 60 percent silver plus copper content a minimum palladium content of 6 percent.

2. A metal alloy as defined by claim 1, wherein the combined silver and copper content is 55%, the palladium content is 6% and gold in the amount of 39%.

3. A metal alloy as defined by claim 1, wherein the combined silver and copper content is 50%, the palladium content is 4% and gold in the amount of 46%.

4. A metal alloy as defined by claim 1, containing gold in the amount of from about 39% to about 47%.

5. A metal alloy according to claim 1, wherein the combined silver and copper content is 60 percent, the palladium content is 6 percent and gold in the amount of 34 percent.

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CHARLES N. LOVELL, Primary Examiner.

U.S. Cl. X.R.

75-122

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,424,577

January 28, 1969

John P. Nielsen et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 36, "60" should read -- 55 --.

Signed and sealed this 7th day of April 1970.

(SEAL)

Attest:

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Commissioner of Patents