Patented May 7, 1940

2,200,050

UNITED STATES PATENT OFFICE

2,200,050

ALLOY

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No Drawing. Application April 3, 1939, Serial No. 265,777. In Germany April 23, 1937

5 Claims. (Cl. 75—165)

This invention relates to alloys, especially to gold alloys, and more particularly to gold alloys to be used for the manufacture of jewelry and rings, and also to jewelry and rings made from these alloys.

The preferred materials hitherto employed for the manufacture of jewelry and rings are 14 and 18-carat gold alloys which satisfy all practical needs. In addition, low-carat gold alloys have also been used, but these materials are unsatisfactory in various respects; for instance they tarnish under certain circumstances and also tend to discolour the skin when worn in contact therewith. The use of gold as a costly material has been replaced for many practical purposes, with thoroughly satisfactory results, by the use of certain palladium-silver-alloys. These alloys, however, are of white colour, while the characteristic colour of gold is highly esteemed, particularly in articles of jewelry and wedding rings.

The present invention has for an object to provide as low-carat a gold as possible (gold content 25–55%, that is, approximately 6 to 13-carat gold) which still has the colour of yellow gold and satisfies the requirements demanded of an approximately higher-carat gold.

Attempts have already been made to solve this problem by alloying gold with palladium and silver, and also with copper, zinc and tin. The resulting alloys do not satisfy practical requirements and therefore have not come into use.

We have now found that alloys capable of satisfying in a high degree the practical requirements for the purposes in question, are obtained by adding zinc and copper in certain proportions to the noble metals gold, palladium and silver.

The new alloys according to our invention have the following general composition by weight: 25–55% (and preferably 33–41%) gold, 2–6% palladium, 10–30% silver, 9–25% zinc and the remainder copper. Particularly valuable alloys are obtained when the ratio of copper to zinc in the alloy is approximately 2:1 by weight.

The new alloys are of pleasing colour the low-carat gold alloys being of a fine golden hue. The new alloys are stable under the conditions of normal use and do not tarnish. They also have no discolouring effect upon the skin.

The described alloys may be worked up by any of the methods and techniques known in the art of making articles of jewelry and rings, without any difficulties being encountered. They lend themselves readily to casting operations and may be repeatedly re-cast and re-alloyed without suffering any loss of quality. These alloys may also be subjected without difficulty to working methods such as wire drawing, punching and stamping.

Without departing from the spirit of the invention, alloys as described may be improved with regard to certain of their properties by the addition of small quantities of further metals, for instance, up to 1% of any of the metals nickel, tin, cadmium and manganese. Thus, for instance, an addition of tin increases the hardness, while an addition of nickel enables a fine-grained structure to be obtained, and cadmium lowers the melting point of the alloy. Other metals may be added to obtain a desired modification in the colour of the alloy.

The invention also embraces articles of jewelry and all kinds of rings manufactured from the alloys described. The invention is of particular significance in this respect since it is a matter of experience that the colour and properties of gold are considered indispensable in wedding rings. The invention solves the problem of providing alloys which, while containing but a small proportion of gold, have the characteristic colour and other properties of this noble metal.

The invention also embraces alloys containing the elements palladium, silver, zinc and copper in the specified proportions but without the addition of gold. These alloys may then be alloyed with the appropriate quantity of fine gold prior to use by the goldsmith.

Examples

1. In the case of low-carat gold alloys containing for example 33.3% gold and 12–17% silver, it is found that the use of copper and zinc in the proportions of approximately 2:1 respectively is particularly suitable. An alloy of this description, composed of 33.3% gold, 3.0% palladium, 17.0% silver, 30.0% copper and 16.7% zinc is used for making wedding rings. These rings, which are thus of 8-carat gold, have the characteristic colour of yellow gold and do not tarnish.

2. A 9-carat alloy composed of 37.5% gold, 4.0% palladium, 18.0% silver, 27.0% copper and 13.5% zinc is suitable for wedding rings. It has the pleasing colour of yellow gold and is resistant to chemical and mechanical influences.

The constituents of the alloys may be fused together in a variety of ways; for instance, in the case of the last example given above the 37.5 parts of fine gold may be melted down together with the other constituents of the alloy, the latter being in th form of finished granules making up the remaining 62.5 parts of the alloy.

3. Articles of jewelry such as necklaces and bracelets are made of an alloy of the following composition: 41.7% gold, 3.0% palladium, 21.0% silver, 21.3% copper and 13.0% zinc. The articles made of this 10-carat gold are equivalent in appearance and properties to articles made of 14-carat or higher-carat gold.

4. A 12-carat alloy composed of 50% gold, 5% palladium, 11% silver, 23% copper and 11% zinc has a pleasing colour and is highly resistant to chemical and mechanical influences.

We wish it to be understood that we do not desire to be limited to the exact compositions contained in the examples, for obvious modifications will occur to a person skilled in the art.

We claim:

1. An alloy containing, by weight, 25–55% gold, 2–6% palladium, 10–30% silver, 9–25% zinc and the remainder copper..

2. An alloy containing, by weight, 25–55% gold, 2–6% palladium, 10–30% silver, 9–25% zinc and the remainder copper, wherein the proportions by weight of the copper and zinc are in the ratio of about 2:1 respectively.

3. An alloy for jewelry and rings containing, by weight, about 33.3% gold, about 3.0% palladium, about 17.0% silver, about 30.0% copper and about 16.7% zinc.

4. An alloy for jewelry and rings containing, by weight, about 37.5% gold, about 4.0% palladium, about 18.0% silver, about 27.0% copper and about 13.5% zinc.

5. An alloy for jewelry and rings, containing, by weight, about 50% gold, about 5% palladium, about 11% silver, about 23% copper and about 11% zinc.

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