Patented Sept. 18, 1923.

1,468,407

UNITED STATES PATENT OFFICE.

ARNOLD SCHROETTER, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN WHITE GOLD MANUFACTURING COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ALLOY.

No Drawing. Application filed October 16, 1919. Serial No. 331,098.

To all whom it may concern:

Be it known that I, ARNOLD SCHROETTER, a citizen of the United States, residing at 886 East 172nd Street, New York, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Alloys, of which the following is a specification.

My invention relates to the production of platinum substitutes or precious alloys having a color like platinum.

An object of my invention is to produce a non-oxidizable non-tarnishable white alloy having approximately the same specific gravity and other of the valuable properties of platinum which can be satisfactorily used in settings, etc., and which can be produced at a moderate cost.

For the purpose of preparing an alloy of this character I employ the following metals: gold, nickel, magnesium, antimony, and zinc.

In preparing one form of my alloy, I proceed as follows:—

To 100 parts of a mixture containing 97½ parts nickel and 2½ parts of gold I add 7 parts of a mixture of non-precious metals having the following composition:

Magnesium	25%
Antimony	12.75%
Zinc	65.25%

All these five metals are preferably in such a physical condition, that upon the application of heat, they can be readily melted in the order of their respective fusibilities, and so will rapidly fuse and co-mingle and alloy with each other.

These five metals are either in the form of powder, granules or such other state of sub-division as will enable them to be readily melted and care is taken that such melting is effected without access of air, so that there is a minimum of oxidation of these metals. This is done in the familiar manner by covering the surface of the crucible in which they are melted with a suitable protective slag.

Whatever proportion of the metals, magnesium, antimony and zinc are oxidized, the oxide is naturally dissolved by the borax or other salts which are used to slag off the impurities in the metals.

The heating is continued until a considerable proportion of the magnesium, antimony and zinc, originally present in the mixture have been volatilized or oxidized. After the liquid metal is in a condition of perfect fluidity and any impurities in the mixture have been removed, the liquid may be poured into any form of convenient mold.

Of the alloy obtained by the process herein described, I take 20% or one part to 80% or four parts of pure gold, and this alloy of one to four furnishes a complete white alloy known as white gold, which is suitable for various jewelry purposes, and the white gold produced by this process has not only the appearance of platinum, but is ductile and not brittle, so that it can be readily worked into wire diamond settings and into various other forms.

I find that the intermediate alloy which afterwards mixed with four parts of gold for the purpose of manufacturing the completed white gold has approximately the following composition in 100 parts.

Nickel	95.80%, that is ninety-five and eight-tenths per cent,
Gold	2.48%, that is two and forty-eight hundredths per cent,
Zinc	1.20%, that is one and two-tenths per cent,
Magnesium	.30%, that is three-tenths of one per cent,
Antimony	.20%, that is two-tenths of one per cent,
Or set out in figures	99.98%.

Where it is desired to produce a white metal of greater hardness than the metal produced by the foregoing process, the proportion of the metals magnesium, antimony and zinc as above specified may be varied somewhat so that in proportion to the 100 parts of nickel and gold the 7 parts represented by magnesium, antimony and zinc may be as follows:

Magnesium	37%
Antimony	10.75%
Zinc	52.25%

but the procedure in the manufacture of the completed white metal is substantially the same as the preceding.

The finished white gold contains less than

approximately only about one-third of one per cent of antimony, zinc and magnesium altogether, the rest of the alloy being substantially gold and nickel. I find, however, that the use of magnesium, antimony and zinc in the alloy is of great importance, as the presence of these metals secures a perfect fusion of the nickel and gold in the finished product, and apparently also having an important function in preventing the oxidation of the nickel.

What I claim is:

1. An intermediate alloy for the production of a white metal, said intermediate alloy containing approximately 95% of nickel, 2½% of gold, and sufficient zinc, magnesium and antimony to produce a definite influence on the finished product, the said sum of zinc, magnesium and antimony totalling less than 2%.

2. An intermediate alloy containing nickel approximately 95%, gold approximately 2½%, zinc 1%, and magnesium and antimony sufficient to produce a definite influence on the finished product, the sum of said magnesium and antimony totalling less than ½ of 1%.

3. An intermediate alloy containing nickel 94.8%, gold 2½%, zinc 1% and antimony and magnesium together totalling $\frac{7}{10}$ of 1%.

4. An intermediate alloy containing approximately 95% of nickel, 2½% of gold, zinc over 1%, together with magnesium and antimony, the magnesium or antimony being present in less proportion than the zinc, both the magnesium and antimony being present in sufficient quantity to produce a definite result.

5. An intermediate alloy composed of nickel more than 90%, gold more than 2% with the addition of antimony, magnesium and zinc, the antimony, magnesium and zinc totalling less than 2%, the antimony, magnesium and zinc being present in sufficient quantity to produce a definite result upon the product.

6. A white gold comprising nickel more than 80 parts, gold, and a total of less than 1% of the three metals, antimony, zinc and magnesium, in combination, the antimony, magnesium and zinc being present in sufficient quantity to produce a definite result upon the product.

In testimony whereof I hereunto affix my signature.

ARNOLD SCHROETTER.