UNITED STATES PATENT OFFICE.

ADOLPH COHN, OF NEW YORK, N. Y.

ALLOY.

1,323,834. Specification of Letters Patent. Patented Dec. 2 1919.

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To all whom it may concern:

Be it known that I, ADOLPH COHN, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Alloys, of which the following is a specification.

This invention relates to improvements in iridium-platinum alloys, and its object is to improve upon alloys of this kind, to increase their hardness and improve their physical characteristics and at the same time reduce their cost. Another object is to provide alloys of platinum for manufacturing purposes which are both better and cheaper than the ordinary iridium-platinum alloys now in use.

These and other objects of the invention will appear in the following specification in which I will describe my invention and the novel features of which will be set forth in appended claims.

Pure platinum is too soft to be used for manufacturing purposes, and it is well known that its hardness may be increased materially by the addition of a desired amount of iridium. Alloys are used with the iridium content from a fraction of a per cent. up to 33⅓% of the whole. Increasing the proportion of the iridium increases the hardness of the alloy. But because of the exceedingly high melting point of iridium, homogeneous alloys containing more than 33⅓% iridium cannot be made. It is especially noticeable in the platinum iridium alloys which contain a large per cent. of iridium, that the alloys are not homogeneous and the tendency of the iridium to separate from the alloy is very marked.

I have discovered an improved way of hardening platinum by substituting gold for some of the iridium. This makes harder alloys of better physical characteristics. For example, an alloy of 90% platinum and 10% iridium, has a scleroscope hardness of 18, while if half of the iridium be replaced by gold, making an alloy of 90% platinum, 5% iridium and 5% gold, the scleroscope hardness is increased to 21. This of course is a cheaper alloy. The proportions of the hardening metals may be varied. For example, if 10% of the alloy is composed of iridium and gold, instead of being half iridium and half gold,—one-quarter iridium and three-quarters gold may be used, which will produce a still harder alloy. It also follows that for any desired hardness, smaller amounts of iridium and gold are required than of the iridium alone.

Another advantage is due to the fact that the melting point of gold is low while iridium in its pure state is almost infusible. Therefore, my platinum, iridium, gold alloys are more easily made and are more homogeneous and more easily soldered. They will not tarnish or corrode, are ductile and malleable, may be worked hot or cold and do not lose their hardness by working or re-melting.

I find decided advantages by alloying platinum with iridium up to 30% of the whole in conjunction with ½% to 15% gold. The proportions of the metals alloyed may be varied throughout these ranges to obtain the required hardness without departing from the spirit and scope of my invention, and I intend no limitations other than those imposed by the appended claims.

What I claim is:

1. An alloy of refined platinum, iridium and gold with an excess of platinum.

2. An alloy of refined platinum, iridium and gold, with 1% to 30% of the whole, iridium, and with ½% to 15% of the whole, gold.

3. An alloy of platinum, iridium and gold with an excess of platinum, with the proportion of gold increased when the proportion of iridium is decreased.

4. An alloy of platinum, iridium and gold with from 1% to 30% of the whole, iridium, and with ½% to 15% of the whole, gold, with the proportion of gold increased when the proportion of iridium is decreased.

5. An alloy of platinum, iridium and gold with an excess of platinum, with the proportion of gold decreased when the proportion of iridium is increased.

6. An alloy of platinum, iridium and gold, with from 1% to 30% of the whole, iridium, and with ½% to 15% of the whole, gold, with the proportion of gold decreased when the proportion of iridium is increased.

In witness whereof, I have hereunto set my hand this 5th day of June, 1919.

ADOLPH COHN.