June 17, 1924. 1,498,073

A. COHN

METHOD OF AND APPARATUS FOR TESTING PLATINUM ALLOYS

Filed Dec. 27, 1923

Fig. 1

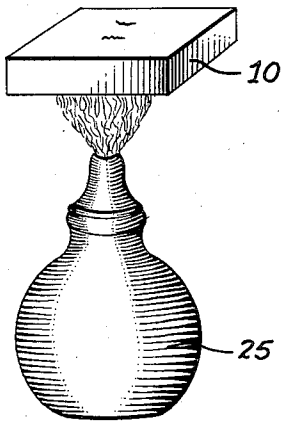


Fig. 2

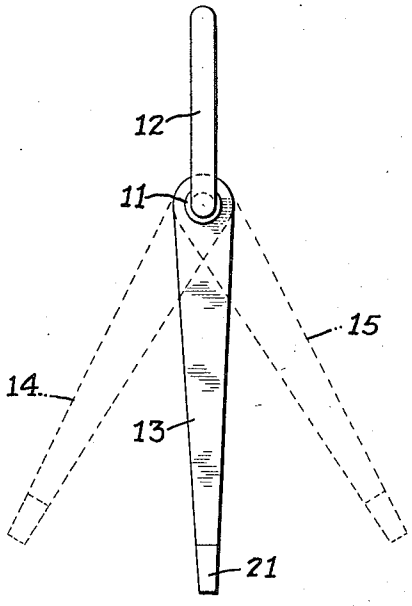
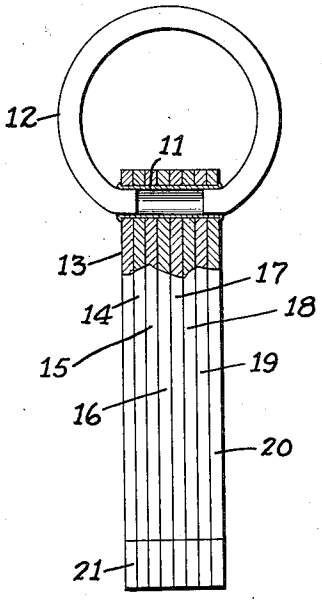


Fig. 3



INVENTOR
ADOLPH COHN
BY
E. W. Marshall
ATTORNEY

Patented June 17, 1924 1,498,073

UNITED STATES PATENT OFFICE.

ADOLPH COHN, OF NEW YORK, N. Y.

METHOD OF AND APPARATUS FOR TESTING PLATINUM ALLOYS.

Application filed December 27, 1923. Serial No. 682,871.

To all whom it may concern:

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

This invention relates to methods of and means for testing the purity of platinum alloys.

As is well known in the arts gold has been tested for purity by comparing the intensity of marks made by rubbing a sample of gold alloy of unknown composition with similar marks made with gold alloy of known composition, after such marks have been made on black colored stone and treated by the application of nitric acid, which has the property of dissolving the metals which are alloyed with the gold and leaving the gold untouched. This method as carried out in testing the purity of gold or gold alloys is not applicable in testing the purity of platinum alloys.

The present invention has for its salient object the provision of a method and of apparatus for testing the purity of platinum alloys and is based on the fact that different alloys of platinum dissolve in certain liquids at varying rates of speed, and that the rate of speed of dissolution varies directly with the percentage of purity of the platinum. That is, the higher the percentage of pure platinum, the slower will be the speed of dissolution.

Further objects of the invention will appear from the following specification taken in connection with the drawings, which form a part of this application, and in which,

Fig. 1 is a perspective view showing apparatus in use in carrying out the method.

Fig. 2 is an elevational view showing one manner of mounting a plurality of samples of platinum alloys of different compositions, and

Fig. 3 is a view taken at right angles to Fig. 2 and partly in section showing the mounting of the samples.

The invention briefly described consists in making scratch marks on a comparatively smooth, flat, dark stone or artificial flint block or other suitable substances not subject to acid action, applying a mixture of nitric and muriatic acids, preferably in substantially equal amounts, to the marks and heating the stone to facilitate the action of the acid. The temperature to which the stone is heated should be below the boiling point of the acid. By using a plurality of different platinum alloys in conjunction with the alloy to be tested, the degree of purity of the alloy to be tested can be determined since certain platinum alloys dissolve much more quickly than other alloys. Further details of the invention will appear from the following description.

Referring to the drawings, there is illustrated in Fig. 1 a block 10 preferably smooth and flat and composed of a dark stone, artificial flint or other suitable substances not subject to acid action.

In Figs. 2 and 3 there is illustrated a testing device, consisting of a sleeve 11 having a handle 12 secured thereto and a plurality of bars or arms 13, 14, 15, 16, 17, 18, 19 and 20 pivoted on the sleeve 11. One of these bars has an end portion 21 of platinum, and each of the other bars has an end portion of a platinum alloy of a known composition. For instance, the following alloys may be used as standard samples, referred to hereinafter as "standards:"

1. Iridium	10%	Platinum	90%
2. Platinum	100%		
3. Palladium	10%	Platinum	90%
4. Palladium	20%	Platinum	80%
5. Palladium	30%	Platinum	70%
6. Palladium	40%	Platinum	60%
7. Palladium	50%	Platinum	50%
8. Palladium	100%		

Marks are made on the block by one or more of the standards and by an article to be tested. These marks are covered by the acid and the block heated. The heat causes chlorine to be liberated and this dissolves the marks more or less rapidly.

Of the standards above enumerated No. 1 will dissolve and disappear slower than No. 2 and Nos. 3, 4, 5, 6, 7 and 8 will dissolve and disappear faster than No. 2, each successive sample in the order named dissolving faster than the preceding sample. Any one of the eight samples may be compared with the sample to be tested and when a sample has been found to dissolve in the same time as that of the sample tested, the degree of purity of the unknown sample will be determined.

The acid used for dissolving the samples preferably consists of a mixture in equal parts of nitric and muriatic acids. As a

matter of fact, any acid may be used which will liberate chlorine when heated. The heat may be applied to the stone in any suitable way as by an alcohol lamp 25 and the stone should not be heated to a temperature above the boiling point of the acid.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. The method of testing platinum alloys which consists in scratching marks on a flat stone with the alloy to be tested and with an alloy of known composition or with pure platinum, covering the marks with a platinum dissolving liquid and comparing the rate of speed of the action of the liquid on the marks.

2. The method of testing platinum alloys which consists in scratching marks on a flat stone with the alloy to be tested and with an alloy of known composition or with pure platinum, heating the stone, covering the marks with a platinum dissolving liquid and comparing the rate of speed of the action of the liquid on the marks.

3. The method of testing platinum alloys which consists in scratching marks on a block of material not subject to acid action and having a smooth, flat, dark surface, with the alloy to be tested and with an alloy of known composition or with pure platinum, covering the marks with a mixture of nitric and muriatic acids, and comparing the rate of speed of the action of the acids on the marks.

4. The method of testing platinum alloys which consists in scratching marks on a block of material not subject to acid action and having a smooth, flat, dark surface, with the alloy to be tested and with an alloy of known composition or with pure platinum, covering the marks with a liquid from which when heated chlorine is liberated, heating the block to liberate chlorine, and comparing the rate of speed of the action of the chlorine on the marks.

5. The method of testing platinum alloys which consists in scratching marks on a block of material not subject to acid action and having a smooth, flat, dark surface, with the alloy to be tested and with an alloy of known composition or with pure platinum, covering the marks with a mixture of nitric and muriatic acids, heating the block to liberate chlorine, and comparing the rate of speed of the action of the chlorine on the marks.

6. A device for use in testing platinum alloys comprising a plurality of arms, each arm having its free end formed of a platinum alloy of known composition.

7. A device for use in testing platinum alloys comprising a plurality of arms, the free end of one arm being formed of pure platinum and the ends of the other arms being formed of platinum alloys of known composition.

8. A device for use in testing platinum alloys comprising a plurality of pivoted arms, the free end of one arm being formed of pure platinum and the ends of the other arms being formed of platinum alloys of known composition.

In witness whereof, I have hereunto set my hand this 26 day of December, 1923.

ADOLPH COHN.