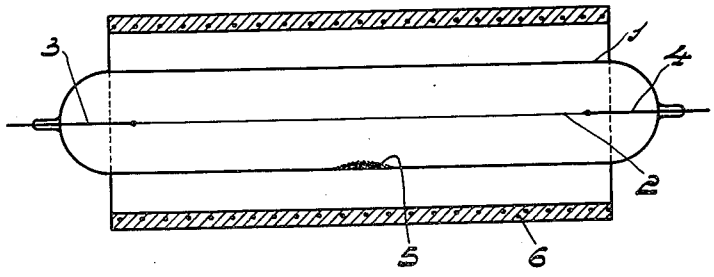
Aug. 11, 1931. E. H. REERINK 1,818,909

PROCESS FOR PRECIPITATING RHODIUM, IRIDIUM, OSMIUM, RUTHENIUM, AND THE LIKE

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Att'ys.

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UNITED STATES PATENT OFFICE

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PROCESS FOR PRECIPITATING RHODIUM, IRIDIUM, OSMIUM, RUTHENIUM AND THE LIKE

Application filed May 14, 1928, Serial No. 277,740, and in the Netherlands October 20, 1927.

The invention relates to a process for precipitating one or more of the rare metals rhodium, iridium, osmium, ruthenium and the like.

According to the invention, the process consists in heating a body in an atmosphere containing one or more volatile carbonyl halogen compounds of the said metals. These compounds contain in addition to one of the said metals, also one or more carbonyl groups (CO) and one or more halogens. It is advisable to use the carbonyl-chlorine compounds of the metals rhodium, iridium, osmium and ruthenium.

The invention will be more fully described and elucidated with the aid of an example illustrated in the single figure of the accompanying drawing.

A metal wire of tungsten, molybdenum, carbon, nickel or the like is stretched in an axial direction in an exhausted vessel between two pole wires which pass through the glass wall thereof. By applying a suitable tension to the pole wires, the metal wire can be heated to the required temperature. In the exhausted vessel, a certain quantity of carbonyl rhodium chloride is placed. The vessel is further entirely surrounded by an oven or heating means by which the vessel is maintained at a temperature at which the carbonyl rhodium chloride has a suitable vapour pressure for carrying the process into effect. If the vessel is heated to a temperature under about 200° C., for example, to 100° C., and if the wire is heated by the passage of a current at about 500° C., metallic rhodium will precipitate on the wire.

By moving the wire that has to be coated with rhodium slowly through the reaction vessel so that the uncoated wire enters at one side of the vessel and the coated wire leaves it at the other side, the process can be made a continuous one.

It has been found that bodies coated, in accordance with the above described process, with one or more of the metals rhodium, iridium, osmium and ruthenium can be mechanically worked in a known manner. Thus, for example, a wire coated with rhodium can be rolled or can be reduced with the aid of drawing dies to a smaller diameter. Such a drawn wire has a rhodium surface which is connected very firmly to the wire core.

The applicant has found that bodies coated with the aid of the process according to the invention with one or more of the metals rhodium, iridium, osmium and ruthenium, are pre-eminently suited to serve as a starting material in the manufacture of incandescent cathodes which superficially contain electron active material, for example, an oxide of the alkaline earths such as barium oxide.

Such an incandescent cathode which superficially contains an electron active material, has a core which consists entirely or partly of a body coated with the aid of the above described process with one or more of the metals rhodium, iridium, osmium and ruthenium. In that case the core may be covered directly with one of the said metals or again between the core and the sheath which consists of one of the said metals, there may be another sheath consisting of other material.

What I claim is:

1. A process for precipitating on a body at least one of the metals rhodium, iridium, osmium and ruthenium, comprising heating said body in an atmosphere containing at least one volatile carbonyl halogen compound of the metal to be precipitated.

2. A process for precipitating on a body at least one of the metals rhodium, iridium, osmium and ruthenium, comprising heating said body in an atmosphere containing at least one volatile carbonyl chlorine compound of the metal to be precipitated.

3. A process of precipitating from the vaporized state on a body at least one metal of the group comprising rhodium, iridium, osmium, and ruthenium, comprising volatilizing a carbonyl halogen compound of the metal to be precipitated, and treating said body in the atmosphere thus produced.

4. A process of precipitating from the vaporized state on a body at least one metal of the group comprising rhodium, iridium, osmium, and ruthenium, comprising volati-

lizing a carbonyl chlorine compound of the metal to be precipitated, and heating said body in the atmosphere thus produced.

5. A process of precipitating from the vaporized state on an elongated body at least one metal of the group comprising rhodium, iridium, osmium, and ruthenium, comprising volatilizing in a substantially enclosed container a carbonyl halogen compound of the metal to be precipitated, passing the body through the container in a substantially continuous feed, and heating at least that portion of the body which is within the atmosphere thus produced.

In testimony whereof I affix my signature, at the city of Tindhoven, this 25th day of April, 1928.

ENGBERT HARMEN REERINK.