

UNITED STATES PATENT OFFICE.

CHARLES W. MERRILL, OF BERKELEY, CALIFORNIA.

PRECIPITANT FOR RECOVERING METALS FROM SOLUTIONS.

1,063,570.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, CHARLES W. MERRILL, a citizen of the United States of America, and resident of Berkeley, Alameda county, State of California, have invented new and useful Improvements in Precipitants for Recovering Metals from Solutions, of which the following is a specification.

My invention relates to an improvement in precipitants for recovering metals from solutions, and particularly to that class of precipitant which is employed for the purpose of precipitating precious metals from cyanid solutions.

In practice, various forms of precipitants are used, but the most satisfactory and economical precipitants which have hitherto been employed in this art, are precipitants composed of malleable metallic zinc in the form of threads or spheres, the spheres composing what is known in practice as "zinc fume." On account of its malleability, metallic zinc has hitherto resisted any form of mechanical comminution down to a powder which will expose sufficient surface to enable it to be used in a process of precipitation which involves agitation, conduction of the mixture, and the subsequent filtration thereof.

Now I have discovered by a study of various solutions and various alloys that the use of certain alloys as compared with metallic zinc will augment the precipitation of solutions, and reduce the consumption of precipitant; also that such alloys can be reduced to a pulverulent form more readily by either the incorporation of an abrasive with the alloy to be subsequently pulverized, or by the use of an abrasive in the grinding operation. Such an alloy precipitant reduced by means of an abrasive to a sufficient fineness to prevent its settlement during the agitation of the solution with it, and during the subsequent conduction of the mixture to the filter is more efficient than either metallic zinc similarly pulverized or what is known as zinc fume or dust, presumably, by virtue of the fact that the galvanic action

between the metals composing the alloy increases the radius of activity of each particle thereof. In practice, such an alloy may be composed of zinc, lead, magnesium, aluminum, or other similar combination of metals, mixed with any abrasive substance, preferably with carborundum, corundum, quartz pebbles, or other form of silica, or any one or more of these substances in suitable proportions, dependent upon the character of the solution to be precipitated and the point of saturation of any particular metal in the alloy employed, and is prepared in any convenient form of reducing receptacle in which they can be brought together. In practice, a vessel is used in which the alloy can be compounded with a minimum of oxidation. After the alloy is mixed, the abrasive substance may be added to it, in any convenient way and the mass allowed to cool. It may then be readily and quickly reduced to a powder in any convenient form of comminuting apparatus. Another method of producing the powder is to form and cool the alloy and subsequently grind it under the action of an abrasive separately introduced into the grinding apparatus. The powder thus formed may be used as a precipitant in the place of the various forms of metallic zinc precipitants which have hitherto been used in any of the well-known processes of cyanidation, according to the practice of those processes.

I claim as my invention:

A precipitant for recovering metals from cyanid solutions, which consists of a powder made from an alloy containing a substance capable of effecting the desired precipitation and an abrasive substance, substantially as described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 15th day of April, 1912.

CHARLES W. MERRILL.

Witnesses:

CHARLES ENGEL,
ROBERT N. CHAMBERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."