1. The improved process of extracting gold and silver from ores and compounds containing the same, substantially as herein described; and consisting in mixing with the pulverised ore or compound sodium-dioxide or other alkaline dioxide, and charging this mixture into a barrel or vessel containing water holding in solution cyanide of potassium or other cyanide, together with sodium-oxide or other alkaline oxide, or a hydrate of an alkaline oxide, and nitrate of soda or other nitrate or a nitrite, and allowing the chemicals to act on the ore until the precious metals are sufficiently dissolved.

2. The improved process of extracting gold and silver from ores or compounds containing the same, substantially as herein described; and consisting in charging the pulverised ore or compound into a barrel or vessel containing water holding in solution cyanide of potassium or other cyanide, sodium-dioxide or other alkaline dioxide, sodium-oxide or other alkaline oxide, or a hydrate of an alkaline oxide, and nitrate of soda or other nitrate or a nitrite, and allowing the chemicals to act on the ore until the precious metals are sufficiently dissolved.

3. The improved process of extracting gold and silver from ores and compounds containing the same, substantially as herein described; and consisting in mixing with the pulverised ore or compound sodium-dioxide or other alkaline dioxide, charging the mixture into a barrel or vessel containing water holding in solution cyanide of potassium or other cyanide, sodium-oxide or other alkaline oxide, or a hydrate of an alkaline oxide, and nitrate of soda or other nitrate or a nitrite, closing the barrel or vessel and forcing air, oxygenated air or oxygen, the contents being then agitated until the precious metals are sufficiently dissolved.

4. The improved process of extracting gold and silver from ores and compounds containing the same, substantially as herein described; and consisting in charging the pulverised ore or compound into a barrel or vessel containing water holding in solution cyanide of potassium or other cyanide, sodium-oxide or other alkaline oxide, or a hydrate of an alkaline oxide, and nitrate of soda or other nitrate or a nitrite, closing the barrel or vessel and forcing in air, oxygenated air or oxygen, the contents being then agitated until the precious metals are sufficiently dissolved.

5. The improved method of working a charcoal filter employed for separating precious metals from a solution, the same consisting in regenerating the charcoal without removing the precious metal therefrom, by heating the charcoal *in situ* or otherwise in order to drive off volatilisable matter, substantially as herein described.

6. In the extraction from auriferous and argentiferous solutions of the precious metals contained therein, repeatedly employing the same body of charcoal for filtering successive charges of solution, and until that body becomes saturated with the precious metals, the active properties of the charcoal being occasionally restored or regenerated by subjecting it to a suitably high temperature.

7. In the treatment of auriferous and argentiferous cyanide solutions for the extraction of the precious metals and of the cyanide contained therein, the employment of a charcoal filter, or series of charcoal filters, substantially as herein described, and whereby the said metals and the cyanide may be either simultaneously or successfully extracted from the solution, the active properties of the charcoal being occasionally restored or regenerated, as herein set forth.

Dated this 8th day of March, 1894. JOHN C. MONTGOMERIE.

IMPROVEMENTS IN THE EXTRACTION OF GOLD AND SILVER AND IN SOLVENTS OF THESE METALS.

I, Dr. Albrecht Schmidt, of 170–171, Müller Strasse, Berlin, Germany, chemist, do hereby declare the nature of my invention for "Improvements in the Extraction of Gold and Silver and in Solvents of those Metals," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the extraction of gold and silver from ores containing one or both of these metals, and further to new and improved solvents for gold and silver.

Weak solutions of cyanide of potassium have hitherto been employed for the extraction of gold from ores, but such extraction proceeds but slowly, more especially when the gold is not finely distributed in the ores.

According to my said invention, I considerably reduce the time required for extracting gold and silver from ores by employing a solution of cyanide of potassium to which a persulphate has been added, such addition having no oxidizing or other deleterious action on the said cyanide of potassium solution, and not impeding the processes to be subsequently employed for the recovery of the metal from the solution.

The composition of the persulphates may be expressed by the general formula: R'_2, S_2, O_8, or R″, S_2, O_8, in which formula R′ signifies a monovalent metal and R″ a divalent one (f.i. NH_4, Ca, Na, &c).

The extraction of gold and silver from ores according to my improved process may be performed at ordinary or at elevated temperatures, and may be put in practice, for example, in suitable leaching-tanks, such as those at present in use for the extraction of gold from ores by the existing cyanide of potassium process, I prefer to carry out my process in the presence of an excess of hydrate or carbonate of alkali or alkaline earth.

In order to practically perform the process of extraction according to the present invention it is advantageous to employ *ab initio* a compound of cyanide of potassium with a persulphate and with hydrate or carbonate of alkali or alkaline earth, since simple mixtures of cyanide of potassium with persulphate are not maintainable for a sufficiently long time.

The above described solvent for gold and silver may practically be obtained in a solid state, f.i., in the following manner:—

Ten parts of carbonate of potassium, forty parts of persulphate of potassium, and fifty parts of powdered cyanide of potassium are ground to a uniform mass. The above proportions are by weight. This compound is permanent, and is dissolved when required.