the nature of the said invention and in what manner the same is to be performed, and make a distinct claim for the especial novelty thereof.

"Now, therefore, the nature and details of the said invention, and the manner the same is to be performed, are particularly described in the following statement:—

"This invention has principally for its object the obtaining of gold from its ores or other similar compounds such as mattes and slags, but it is also applicable for obtaining silver from its ores or compounds, and it comprises an improved process which, whilst applicable to ores or compounds generally, is effectual with ores and compounds from which gold and silver have hitherto been easily obtainable.

"In carrying out the invention, the ore or other compound in a powdered state is treated with a solution containing cyanogen or a cyanide such as the cyanides of potassium, sodium or ammonium, or other substances or compounds containing or yielding cyanogen, till all, or nearly all, of the gold or silver is dissolved, the operation being conducted in a wooden vessel, or a vessel made of or lined with a material not acted on to any considerable extent by the solution or substances contained therein. The solution is then drawn off, and the metal or metals are recovered by any suitable process, and the cyanogen, cyanide, or substance containing or yielding cyanogen may be regenerated. The cyanogen, or substance containing or yielding cyanogen, may be used as such, or such materials may be taken as will, by mutual action, form cyanogen, or substances containing or yielding the same.

"Under certain circumstances it may be found desirable to conduct the operation under pressure, in which case a closed vessel must be employed, and in any case, if found advisable, such operation may be carried on under varying conditions of temperature, and in either opened or closed vessels.

"Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, we declare that what we claim is the process for obtaining gold and silver from ores and other compounds, consisting in treating such ores or compounds with cyanogen or a cyanide, or other substance or compound containing or yielding cyanogen, substantially as specified.

"And we do hereby, for ourselves, our heirs, executors, and administrators, covenant with Her Majesty, her heirs and successors, that we believe the said invention to be a new invention as to the public use and exercise thereof; that we do not know or believe that any other person than ourselves is the true and first inventor of the said invention; that we will not deposit these presents at the Patent Office with any such knowledge or belief as last aforesaid.

"In witness whereof we have hereunto set our hands and seals this 12th day of December, 1887.

"John Stewart MacArthur.
"Robert Wardrop Forrest.
"William Forrest.

"Witness—Alexander Forson Stewart, 319, Crown Street, Glasgow."

"Whereas we, John Stewart MacArthur, analytical and technical chemist, of 15, Princes Street, Pollokshields, in the County of Renfrew, North Britain, Robert Wardrop Forrest, M.D., and William Forrest, M.B., both of 319, Crown Street, Glasgow, in the County of Lanark, North Britain, are desirous of obtaining letters patent for securing unto us Her Majesty's special license that we, and such others as we should at any time agree with, should from time to time during the term of fourteen years (to be computed from the day on which this instrument shall be left at the Patent Office) make, use, and vend within the colony of New Zealand and its dependencies an invention for 'Improvements in extracting gold and silver from ores or other compounds,' and, in order to obtain the said letters patent, we must, by an instrument in writing under our hands and seals, particularly describe the nature of the said invention, and in what manner the same is to be performed, and make a distinct claim for the especial novelty thereof.

"Now, therefore, the nature and details of the said invention, and the manner in which the same is to be performed, are particularly described in the following statement:—

"Our said invention relates principally to the process of the kind described in our Patent Specification No. 2775, dated 1st February, 1888, and has for its object to improve the same, and also to lessen the quantities of chemicals employed therein.

"One improvement consists in preparatorily treating or mixing the powdered ore or other compound with potash or lime or other alkali or alkaline earth, which may be allowed to remain with the ore or compound, or which may be washed out if soluble. In some cases, as, for example, when mercury cyanide is used, it is advantageous for the alkali or alkaline earth to remain. After this preparatory treatment the ore or compound, which may consist of tailings or residues from other processes or operations, may be treated as described in our earlier specification hereinbefore referred to. We prefer, however, to cause the cyanide solution to percolate through the materials once or oftener, until all or nearly all the precious metals are dissolved. For this percolation very simple tanks, vats, or vessels may be used, such vessels being provided with permeable false bottoms or any suitable filtering apparatus. The separate solution is next made to pass through a mass of metallic zinc in a state of fine division. We find that the best results are obtained in this part of the process when the zinc has been freshly divided by mechanical or other means, so that its surfaces are as purely metallic as possible, and, further, when the quantity or mass of zinc employed is such that the solution has in passing through it ample opportunity for being thoroughly acted on.

"This improved zinc process is also advantageously applicable with other than cyanide solutions containing the precious metals—that is, with solutions, such, for instance, as chlorides, bromides, thiosulphates (sometimes called hyposulphites) or sulphates, obtained in the well-known Plattner,