

UNITED STATES PATENT OFFICE.

EDWIN P. WELCH, OF DENVER, COLORADO.

PROCESS FOR TESTING OR REDUCING ORES.

No. 919,663.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN P. WELCH, citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Processes for Testing or Reducing Ores; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a process for testing and reducing ores, and has for an object to provide a combination of certain reagents and the re-actions thereof which reduces ores and properly separates the metallic therein found which can be identified in any usual well known manner.

A further object of the invention is to provide certain chemicals which, when mixed with powdered ore and ignited, reduces the ore to its metallic constituents.

With these and other objects in view, the invention comprises certain novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

The present invention consists in mixing with powdered ore potassium chlorate, a chemical which furnishes a considerable amount of oxygen, and a carbon, and then igniting the mixed mass.

It will be obvious that there are a number of chemicals which will respond to the requirements, but preferably potassium chlorate is employed in the proportion of twenty parts by weight, sodium peroxid, two parts by weight, and carbonaceous substance seven-teen parts by weight. Instead of employing two parts of sodium peroxid a mixture of sodium peroxid and manganese dioxid may be employed, preferably in the proportion of seven parts of sodium peroxid and one part of manganese dioxid. The carbonaceous substances employed are preferably wheat flour and argol in the proportion of thirteen parts by weight of wheat flour to four parts of the argol.

While the chemicals above referred to employed in the proportions mentioned may be mixed with the ore direct and ignited, it is found that the mixture is dangerous for the purpose of handling, transportation and the like, and for such purpose if commercially employed in other proportions than those above stated.

Preferably the potassium chlorate, twenty parts, wheat flour, thirteen parts, and two parts of the argol are mixed and formed into a cake or tablet of any approved and desired form, shape and size. The remaining two parts of argol are then inclosed in a separate receptacle, and the two parts of sodium peroxid or its equivalent inclosed in another receptacle.

In use equal parts of the argol in powdered form, the sodium peroxid and ore in powdered form are mixed thoroughly and are placed upon the top of the cake or tablet above referred to and the whole ignited. For the purpose of proper combustion the cake or tablet is supported in any approved means whereby the air can properly come in contact with the ignited mass to supply oxygen thereto.

Instead of employing the sodium peroxid contained in the receptacle alone it is found desirable for many purposes to employ a mixture composed of seven parts of the sodium peroxid and one part of manganese dioxid, the reaction when ignited seeming to be accelerated by such addition. Therefore, as a specific composition, for carrying into effect the present process a cake or tablet is employed composed as follows:

Potassium chlorate . . . twenty parts,
Wheat flour thirteen parts,
Argol two parts.

In a separate receptacle additional argol is stored. In still another separate receptacle sodium peroxid or the mixture of sodium peroxid and manganese dioxid is stored.

The ore to be tested is ground to a fine powder and a small quantity mixed with equal parts of the argol and the sodium peroxid mixture and placed upon the tablet and the whole ignited. After thorough combustion the resultant mass is finely powdered and by examining with a glass the metallic particles can be identified by their color or may be panned and identified by any of the usual well known means.

What I claim is—

1. The process of reducing ores consisting in mixing ore in a finely powdered form with material containing potassium chlorate and sodium peroxid, and carbon containing material, and igniting the mass.

2. The process of reducing ores consisting in mixing the ore in a finely powdered state with material containing potassium chlorate,

sodium peroxid, manganese dioxid, argol, wheat flour and igniting the mass.

3. The process of reducing ores consisting in mixing the ore in a finely powdered state with a composition containing potassium chlorate twenty parts, material rich in oxygen two parts, carbon containing material seventeen parts, and igniting the mass.

4. The process of reducing ores consisting in mixing the ore in a finely powdered state with a composition containing potassium chlorate twenty parts, sodium peroxid and manganese dioxid two parts, carbon containing material seventeen parts.

5. The process of reducing ores consisting in mixing the ore in a finely powdered state with a composition containing potas-

sium chlorate twenty parts, material rich in oxygen two parts, wheat flour thirteen parts, argol four parts.

6. The process of reducing ores consisting in mixing the ore in a finely powdered state with a composition containing potassium chlorate twenty parts, sodium peroxid and manganese dioxid two parts, wheat flour thirteen parts, argol four parts, and igniting the mass.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWIN P. WELCH.

Witnesses:

ISABEL M. STRONG.

CARLE WHITEHEAD.