added to the bath together, or better, the ore is to be added first. The subsequent part of the process is to be conducted as already described for the ores of the first class.

12. When protosulphate of iron is used instead of the protochlorid in preparing the bath, or in keeping up its strength, as in . the case of ores of the first class, sulphate of soda is formed, which may in great part be crystallized out by extremes of heat and cold. The formation and accumulation of this sulphate may, however, be prevented by the use of chlorid of calcium as already set forth. The still larger production of sulphate of soda, which would take place if calcined ores of the second class were added directly to the bath, is prevented by the use of lime as already described, and that portion which must result from the excess of sulphate of copper, as recommended, may be decomposed by the addition of small portions of chlorid of calcium from time to time. By attending to these precautions the strength of the bath in chlorid of sodium, and its solvent power may be indefinitely maintained.

13. We do not claim the use of any particular form of furnace, nor of any special arrangement for calcining, lixiviating or precipitating, reserving to ourselves the choice of the best forms of apparatus for these purposes; neither do we claim the use of protosalts of iron otherwise than in solution, nor the use of perchlorid or other persalts of iron, nor yet the use of sulphurous acid save and except in connection with protosalts of iron, as already set forth.

14. What we claim as our invention is :

I. The use and application of a solution of neutral protochlorid of iron, or of mixtures containing it, for the purpose of converting the oxyd or suboxyd of copper, or their compounds, into chlorids of copper.

II. The use of sulphurous acid for the purpose of decomposing the oxychlorid of iron formed in the preceding reaction.

III. The use of a process for the purpose of extracting copper from its naturally or artificially oxydized compounds by the aid of the first, or the first and second of the above reactions, substantially in the manner already set forth.