

# UNITED STATES PATENT OFFICE.

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CHEMICAL REAGENT FOR USE IN THE MANUFACTURE OF ALLOYS.

SPECIFICATION forming part of Letters Patent No. 485,453, dated November 1, 1892.

Application filed May 19, 1892. Serial No. 433,622. (No specimens.)

*To all whom it may concern:*

Be it known that I, SHERWOOD E. CHEESEMAN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have discovered a certain new and useful Chemical Reagent for Use in the Manufacture of Alloys; and I do hereby declare that the following is a full, clear, and exact description of the same.

10 The reagent consists of an alkaline liquid holding an arsenite in solution or an insoluble arsenite in suspension. Taking zinc arsenite as an example, it is prepared as follows: Dissolve one-half ( $\frac{1}{2}$ ) ounce of caustic  
15 potash and one-fourth ( $\frac{1}{4}$ ) ounce of arsenious acid in a small quantity of water by gentle heat and add the solution to twelve (12) ounces of a saturated solution of zinc sulphate and warm the mixture over the flame of a Bunsen  
20 burner. Zinc arsenite and potassium sulphite are formed together with some zinc hydrate, (the zinc being in excess of the arsenious acid,) while there still remains sufficient caustic potash to maintain a decidedly alkaline reaction. In making an alloy I weigh  
25 one-half ( $\frac{1}{2}$ ) ounce of one of the metals (say copper or its salts) and wash it with one-fourth ( $\frac{1}{4}$ ) ounce of concentrated sulphuric acid and then with a mixture of one dram of  
30 sulphuric acid and eight (8) drams of water. Transfer the metal to an earthenware vessel and add one-half ( $\frac{1}{2}$ ) ounce of mercury and warm over the flame of a Bunsen burner. When this is complete, the amalgam, which  
35 now weighs about one and a half ( $1\frac{1}{2}$ ) ounces, is placed in a mortar and ground and then filtered through a chamois-skin in the usual manner to free it from excess of mercury. Ten grains of the remaining metal (say silver)  
40 finely divided are placed in a vessel and ninety grains of the amalgam, prepared as above, are added thereto and mixed with a few drops of the alkaline liquid holding zinc arsenite in suspension. Amalgamation immediately takes  
45 place, after which the mercury is removed in the usual manner.

The peculiar action of the arsenites in alkaline liquids may be illustrated as follows: If the mixture be prepared by using one hundred (100) grains of zinc sulphate, sixty-six (66) 50 grains of potassium hydrate, and twenty (20) grains of arsenious acid, and copper be treated with the liquid, as previously described, the malleability and ductility of the metal are increased; while a luster is imparted which requires a longer time to become tarnished than 55 in copper not so treated. Again, if these salts are mixed in the proportion of one hundred (100) grains of zinc sulphate, thirty-three (33) grains of potassium hydrate, and sixty-six (66) 60 grains of arsenious acid the copper is rendered harder and requires a higher degree of heat for fusion. Iron is rendered harder and of a finer texture when treated by the reagent. A soluble arsenite may be made with thirty- 65 three (33) grains of sulphate of soda, sixty-six (66) grains of arsenic, and thirty-three (33) grains of hydrate of potash. Another method is to omit the sulphate of soda.

My reagent facilitates the union of metallic 70 bodies to form amalgams and alloys and so modifies the physical properties of the component metals as to make said reagent a valuable agent in the metallurgy of alloys.

In Letters Patent of the United States for 75 an improvement in alloys, granted to me under date of January 5, 1892, No. 466,455, the method of making alloys with the various metals is more fully described.

Having fully described my invention, what 80 I now claim as new, and desire to secure by Letters Patent, is—

A new composition of matter for the purpose set forth, consisting of an alkaline liquid and an arsenite.

SHERWOOD E. CHEESEMAN.

Witnesses:

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