

UNITED STATES PATENT OFFICE.

FRANCIS ALPHA COTHIAS, OF IVRY-PORT, FRANCE.

ALLOY.

SPECIFICATION forming part of Letters Patent No. 586,095, dated July 13, 1897.

Application filed April 2, 1897. Serial No. 630,446. (No specimens.) Patented in France June 2, 1896, No. 256,852; in Belgium June 30, 1896, No. 122,223; in England June 30, 1896, No. 14,479; in Austria July 31, 1896, No. 46/3,442; in Italy July 31, 1896, No. 42,221; in Luxemburg July 31, 1896, No. 2,582, and in Spain July 31, 1896, No. 19,417.

To all whom it may concern:

Be it known that I, FRANCIS ALPHA COTHIAS, a citizen of the Republic of France, residing at 9 Rue Victor Hugo, Ivry-Port, Seine, in the Republic of France, have invented certain new and useful Improvements in Alloys, of which the following is a full, clear, and exact specification.

The invention has been patented in France, No. 256,852, dated June 2, 1896; in Belgium, No. 122,223, dated June 30, 1896; in Austria, No. 46/3,442, dated July 31, 1896; in Italy, No. 42,221, dated July 31, 1896; in Luxemburg, No. 2,582, dated July 31, 1896; in England, No. 14,479, dated June 30, 1896, and in Spain, No. 19,417, dated July 31, 1896.

The invention forming the subject of this application relates to a new metallic alloy and process of making the same. This alloy has considerable tensile strength. Its resisting force is as high as thirty kilograms per square millimeter of section. It can be soldered and worked with the greatest ease. It consists of a mixture in given proportions of copper, tin, and aluminium, to which I add chlorid of ammonia and phosphorus in the state of salt.

The composition of this alloy is as follows: copper, forty grams; tin, eighty grams; aluminium, eight hundred and eighty grams; total, one thousand grams.

This alloy has a density below three and is worked without fouling the tools and can be very easily tinned.

To manufacture this alloy, I proceed in the following manner: I begin by putting into a crucible the requisite quantities of copper and tin, and I let them melt together. This first alloy being well melted, I leave it to cool down until it becomes a pasty mass. Then I add the requisite proportions of aluminium, which immediately heightens the temperature of the mass, and finally I heat the matter to a very high temperature. The substances are thereby combined in the most complete manner and I obtain a perfectly homogeneous alloy.

In order to facilitate the combination of the

various elements and reduce the oxids that will form at every melting, I add during the last manipulation about a kilogram of chlorid of ammonia per one thousand kilograms of alloy. I add also during the last manipulation a small quantity of phosphorus in order to give to the alloy an easier flow and greater fluidity. This phosphorus can be used in the state of salt. These salts are phosphites of titanium, manganese, wolfram, tungsten, &c., which further increase the hardness of the alloy.

When the alloy is completely molten, it is cast into ingot-molds, wherein it is left to cool.

To make perfectly sure that the composition of the alloy is rigorously correct, a sample is taken and analyzed, and if one finds that the requisite proportions do not exist the alloy is melted over again and such material added as is necessary to give to the mass the requisite composition.

The various metals used to increase the resisting force and hardness of alloys (titanium, manganese, wolfram, tungsten; &c.) are added to the mixture in the state of salts (chiefly in the state of phosphides) either during the last melting or during a remelting of the ingot performed after the first casting and the taking of the samples.

The alloy obtained in the way described above is fusible at a temperature below 300° centigrade. It is sufficient to heat it in kettles in the open air, like lead or tin, and without furnaces or crucibles being required.

This alloy molds itself perfectly in metal molds.

I claim—

The described alloy consisting of copper forty parts; tin eighty parts and aluminium eight hundred and eighty parts.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FRANCIS ALPHA COTHIAS.

Witnesses:

EMILE BERT,
EDWARD P. MACLEAN.