

UNITED STATES PATENT OFFICE.

WILLIAM VINCENT SHELTON, OF CONSTANTINOPLE, TURKEY, ASSIGNOR TO
PHILIP SYNG JUSTICE, OF LONDON, ENGLAND.

ALLOY.

SPECIFICATION forming part of Letters Patent No. 423,281, dated March 11, 1890.

Application filed November 26, 1889. Serial No. 331,692. (No specimens.) Patented in Belgium July 19, 1888, No. 82,610; in England July 19, 1888, No. 2,722, and in France December 18, 1888, No. 194,853.

To all whom it may concern:

Be it known that I, WILLIAM VINCENT SHELTON, a subject of the Queen of Great Britain, residing at Constantinople, Turkey, have invented certain new and useful Improvements in Alloys, (for which Letters Patent have been granted in Belgium under date of July 19, 1888, No. 82,610; in Great Britain under date, by virtue of international convention, of July 19, 1888, No. 2,722 of 1889, and in France under date of December 18, 1888, No. 194,853;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is the production of a species of bronze or brass of great hardness, toughness, and tensile strength, and capable of being rolled or otherwise worked in either the hot or cold state, the said qualities varying in degree according to the relative proportions of the ingredients used in the manufacture of the product and the intended applications thereof. The said product is obtained by the combination, as hereinafter more fully specified, of copper, iron, manganese, zinc, nickel, silicon, and carbon.

I am aware that copper in combination with one or several of the above-noted elements has been employed in the manufacture of alloys, most of which have, however, been found open to some objections—such, for instance, as deficiency in homogeneity and toughness if made hard, or incapability of being worked hot when possessed of hardness and tensile strength. These and other well-known defects inherent to most alloys of this class hitherto known are obviated by the present invention, in the execution of which I proceed substantially as follows:

In a crucible or furnace of any suitable description are melted copper, nickel, ferro-manganese, ferro-silicon, and ferro-cyanide of potassium, (yellow prussiate of potash.) Zinc is then introduced and thoroughly incorporated with the other materials. The draft is then lowered and a quantity of carbonate of soda equal to about two per cent.

of the weight of the metal in fusion is added thereto, and a few minutes later the product may be run off into molds of any suitable description.

As above stated, the relative proportions of the ingredients have to be varied according to the qualities required in the alloy. Roughly stated, these proportions may for most practical purposes range within the following limits for each hundred pounds's weight of copper employed: Zinc, from thirty-four to sixty-two pounds; ferro-manganese, (at about eighty-four per cent. of manganese,) four to six pounds; ferro-silicon, (at about fourteen per cent. of silicon,) one to two pounds; nickel, say from two to four ounces; ferro-cyanide of potassium, say from ten to thirty ounces, and where a special hardness and toughness is desired about one per cent. of tin may be added.

The following table shows a number of modifications of the above typical proportions, which may be substituted for the latter in the manufacture of various grades of my improved alloy, according to the special qualities desired to predominate therein—such as hardness, tenacity, ductility, and applicability to hot or cold working, as the case may be.

	Copper.	Zinc.	Ferro-manganese.	Ferro-silicon.	Nickel.	Prussiate of potash.
	Lbs. (av.)	Lbs.	Lbs.	Lbs.	Grains.	Oz.
1	100	62½	6	2	1,000	10
2	100	60	6	2	1,000	10
3	100	58½	5	1	1,000	10
4	100	57	4	1	1,000	10
5	100	56	4	1	1,000	10
6	100	62	4	1	1,000	10
7	100	60	4	1	850	10
8	100	34	4	1	850	10
9	100	34	6	2	850	10
10	100	40	4	1	850	10
11	100	38	4	1	850	10

From the above table a series of products may be obtained capable of supplying a wide range of requirements. I nevertheless do not confine myself to the proportions therein set forth, which, I repeat, are only given as

examples, to be varied according to circumstances.

I would observe, in conclusion, that I lay no claim to alloys composed of copper, zinc, iron, or ferro-manganese and ferro-silicon, which, I am aware, have long been known and manufactured under different forms; but

What I claim, and desire to secure by Letters Patent, is—

1. An alloy composed of copper, zinc, nickel, iron, manganese, and silicon, substantially as described.

2. An alloy composed of zinc, iron, manganese, silicon, copper, and nickel, the copper and nickel being in the proportion of one hundred pounds to two to four ounces, respectively, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM VINCENT SHELTON.

Witnesses:

JOSEPH U. STREATER,
FRANK FREWEN.