UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING ALLOY.

SPECIFICATION forming part of Letters Patent No. 666,670, dated January 29, 1901.

Application filed December 26, 1899. Serial No. 741,692. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES THEODORE HENNIG, a resident of New York, (Brooklyn,) State of New York, have invented a new and useful Process for Making Alloys, of which the following is a full, clear, and exact description.

My invention is a process for combining copper, zinc, iron, and manganese (or cobalt) into a useful alloy. Combined in certain proportions these metals form a useful alloy, which is malleable at a dark-red heat, which has great tensile strength, and which is not readily acted upon by alkalies or acids. Combined in other proportions the resulting alloy has less malleability, but greater hardness, and so on.

To produce various results, I may use from fifty to sixty-five parts of copper, from thirty-three to fifty parts of zinc, from one to fifteen parts of iron, and from one-sixth part to eight parts of manganese, (or cobalt.) For example, first, to make a useful alloy which is forgeable at a dark-red heat and which has great tensile strength I use, say, fifty-five pounds of copper, forty-five pounds of zinc, three pounds of iron, and two-thirds of a pound of manganese; second, to make a useful alloy for casting, say, fifty-five pounds of copper, forty-five pounds of zinc, six pounds of iron, and two and three-fourths pounds of manganese; third, for very hard castings, say, fifty-five pounds of copper, forty-five pounds of zinc, twelve pounds of iron, and five and one-half pounds of manganese. When these metals are together in a molten state, I effect their combination into a useful alloy by introducing into the mixture a suitable carbonate, such as carbonate of potash, carbonate of soda, carbonate of ammonia, or bicarbonate of soda.

The manganese specified may be added in the form of an oxid or in the form of cupromanganese or of ferromanganese.

In making my alloy the ingredient metals are preferably melted together in a crucible or other suitable receptacle. For example, the iron and the manganese may be added first with a portion of the zinc and copper—say one-fourth—and melted and the balance of the zinc and copper added gradually and melted. When the ingredients are all melted and together, I effect their combination into a useful alloy by plunging and stirring into the molten mass a suitable carbonate, such as carbonate of potash—say from one-fourth of a pound to a pound per one hundred pounds of the alloy.

I have found it advantageous shortly before the alloy is poured to stir the molten mass rather quickly once or twice with a stick of wood.

Other carbonates of alkali metals—such as carbonate of soda, or carbonate of ammonia, or bicarbonate of soda—may be employed in lieu of the carbonate of potash above specified.

The carbonate employed is preferably introduced into the molten mass wrapped in a paper or other suitable package.

Cobalt may be used in lieu of manganese, if desired.

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

1. The process of combining from fifty to sixty-five parts of copper, from thirty-three to fifty parts of zinc, from one to fifteen parts of iron and from one-sixth part to eight parts of manganese into a useful alloy which consists in melting those metals together and in stirring into the molten mass, carbonate of an alkali metal, substantially as specified.

2. The process of combining from fifty to sixty-five parts of copper, from thirty-three to fifty parts of zinc, from one to fifteen parts of iron and from one-sixth part to eight parts of manganese into a useful alloy which consists in melting those metals together and in introducing into the molten mass, carbonate of an alkali metal, and in stirring the mass with a stick of wood, substantially as described.

In testimony whereof I have hereunto signed my name.

CHARLES THEODORE HENNIG.

Witnesses:
JAMES R. HATMAKER,
EDGAR FREEMAN.