# UNITED STATES PATENT OFFICE.

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## ALLOY OF ALUMINIUM AND PROCESS OF MAKING.

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*To all whom it may concern:*

Be it known that we, THOMAS ABRAHAM BAYLISS and BYRON GEORGE CLARK, subjects of the King of England, and residents, respectively, of Warwick, in England, and London, in England, have invented certain new and useful Improvements in Alloys of Aluminium and Processes of Making, of which the following is a specification.

This invention relates to improvements in alloys of aluminium containing aluminium, zinc, and cadmium.

The invention comprises broadly an alloy composed of aluminium, zinc and cadmium which is malleable and which consists mainly of aluminium. More particularly the ingredients are present in the finished alloy in proportions between the limits of aluminium 80–99%, zinc 0.001–19.999%, cadmium 0.001–10%.

A preferred method of manufacturing the alloy according to the present invention is as follows: The aluminium is melted in a pot or furnace, and zinc and cadmium are then added in their required proportions, within the limits set forth above, with or without the addition of a suitable flux. The whole mass is maintained in a molten condition until the zinc and cadmium have become evenly disseminated throughout the mass, and then allowed to cool. A modified method of manufacturing this alloy consists in first alloying the zinc and cadmium together in the proper proportions and adding this latter alloy to the mass of aluminium under the conditions described above to produce the required composition. The zinc and cadmium may be added either in a solid or molten condition to the aluminium. The alloy produced by either of the above methods may be cast in molds or utilized in any other suitable manner, that is to say it may be sand or chill cast and subsequently rolled, annealed or stamped, and the resultant alloy is found to possess properties hitherto unattainable with aluminium or its alloys, namely, in addition to increased strength, it is found to be malleable and workable under all conditions and to have a smooth cast surface which may be readily machined. Further, the metal thus obtained is extremely tough and strong and is malleable and suitable for stamping and like purposes, so that utensils, ornamental objects, et cetera, may be readily formed therefrom, also strip wire and the like. It may be rolled into long lengths such as lengths of 100 feet or 200 feet or the like suitable for commercial requirements.

The metals may be present in any proportions within the limits set forth herein, and by way of example there are given two alloys having compositions as follows: 1. Aluminium 91%, zinc 8%, cadmium 1%. 2. Aluminium 88%, zinc, 10%, cadmium 2%. Both these alloys are strong and highly malleable when cast in chill molds for rolling; when cast in sand molds the castings have a fine smooth surface and can be readily machined, turned or screw-cut.

Although particular proportions of the ingredients have been given above and particular methods of producing the alloy have been described, the invention is not limited to the details and the absolute limits given, but such variations may be employed as may be found desirable, provided that the spirit of the invention is not departed from.

What we claim as our invention and desire to secure by Letters Patent is:—

1. A malleable alloy composed of aluminium, zinc and cadmium and consisting mainly of aluminium, the proportion of aluminium being sufficient to impart to the alloy a degree of malleability that will enable the alloy to be formed into utensils, et cetera.

2. A malleable alloy composed of aluminium, zinc and cadmium in which the ingredients are present in proportions between the limits of aluminium 80–99% zinc 0.001–19.999% and cadmium 0.001–10%.

3. A malleable alloy containing aluminium 91%, zinc 8% and cadmium 1%.

4. The hereindescribed process of preparing a malleable alloy composed of aluminium, zinc and cadmium and consisting mainly of aluminium, which consists in heating the aluminium to bring it into a molten condition, alloying together the zinc and cadmium and adding that alloy to the molten aluminium to make the composition required, and thereafter allowing the alloy to cool.

5. The hereindescribed process of preparing a malleable alloy composed of aluminium, zinc and cadmium and consisting mainly of aluminium, which consists in heating the aluminium to bring it into a molten condition, alloying together the zinc

and cadmium and adding that alloy to the molten aluminium to make the composition required, maintaining the whole mass in a molten condition until the zinc and cadmium have become evenly disseminated throughout the mass, and thereafter allowing the alloy to cool.

6. The hereindescribed process of preparing a malleable alloy composed of aluminium, zinc and cadmium and consisting mainly of aluminium, which consists in heating the aluminium to bring it into a molten condition, alloying together the zinc and cadmium and adding that alloy to the molten aluminium with the addition of a suitable flux to make the composition required, maintaining the whole mass in a molten condition until the zinc and cadmium have become evenly disseminated throughout the mass, and thereafter allowing the alloy to cool.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

T. A. BAYLISS.
BYRON GEORGE CLARK.

Witnesses:
RONALD S. DOLLEYMORE,
HARRY S. ELRIDGE.