

# UNITED STATES PATENT OFFICE.

GEORGE ESKHOLME BUTTENSCHAW, OF MANCHESTER, ENGLAND.

## MANUFACTURE OF ALLOYS.

No. 854,462.

Specification of Letters Patent.

Patented May 21, 1907.

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*To all whom it may concern:*

Be it known that I, GEORGE ESKHOLME BUTTENSCHAW, a subject of the King of Great Britain and Ireland, residing at Beechwood, Chorlton-cum-Hardy, Manchester, in the county of Lancaster and Kingdom of Great Britain and Ireland, have invented new and useful Improvements in the Manufacture of Alloys, of which the following is a specification.

The object of my invention is to produce articles in an alloy suitable for use in the construction of marine engines, pumps, sea valves, torpedo tubes, and the like, which are brought into contact with salt water and which shall not be liable to oxidize or set up galvanic action in the presence of iron and steel.

I carry out my invention by employing a white alloy which gives a microstructure showing a strong primary net work formed in a hard matrix, of which either compound satisfies a chemical combination without the existence of any free metal likely to act as a base in the formation of metallic salts in sea water. The undermentioned constituents arranged in the following approximate proportions will effect this object: copper 40, zinc 41, nickel 10, lead 3.5, phosphor tin 1, aluminium 0.15. The proportions of the constituents here given may for certain requirements be slightly modified, as for a test requiring increased or decreased elongation the atomic proportions of zinc with copper would be made by a variation of 2% in the zinc, or in some cases where increased hardness is required the addition of 0.1 to 0.2% parts of manganese may be made with advantage.

I have found that instead of a direct melting of the constituents a better result

is obtained by employing a sequence of alloys. I first obtain a combination of alloys in the first stage by obtaining a combination of two atomic proportions of copper with one atomic proportion of nickel, which combination is assisted by the presence of 0.15 of aluminium, which when added to the fused metals increases the temperature, facilitating the production of the alloying material, 30 per cent of this alloy is then added to the following: copper 23.54, zinc 43.86, lead 1.60, tin 0.95, phosphorus 0.05. The alloy as finally formed consists of the following approximate proportion of its constituents, copper 43.19, zinc 43.86, nickel 10.20, lead 1.60, tin 0.95, phosphorus 0.05, aluminium 0.15.

By the modified method of producing my improved alloy in some cases, as for a test requiring increased or decreased elongation, in addition to the atomic proportions of zinc with copper being varied, a variation of 1½ per cent in the lead may likewise be made with advantage.

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

An alloy consisting of metals in the following proximate proportions by weight: copper, 40 to 43.19%, zinc, 41 to 43.86%, nickel, 10 to 10.20%, lead, 1 to 3.5%, phosphor tin, 1%, aluminium, 0.15%, substantially as, and for the purpose, set forth.

In witness whereof I have hereunto signed my name this 20th day of October 1905, in the presence of two subscribing witnesses.

GEORGE ESKHOLME BUTTENSCHAW.

Witnesses:

JULIUS RÖYKE,  
HUGO LIEBELT.