

# UNITED STATES PATENT OFFICE.

ALFRED H. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY  
MESNE ASSIGNMENTS, TO AMERICAN BRONZE COMPANY, A CORPORATION OF PENNSYLVANIA.

## ALLOY.

No. 849,927.

Specification of Letters Patent.

Patented April 9, 1907.

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*To all whom it may concern:*

Be it known that I, ALFRED H. SMITH, a subject of the King of Great Britain, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Alloys, of which the following is a specification:

One object of my invention is to provide an alloy which while being useful in any branch of the arts requiring a bronze shall be particularly adapted for use as a bearing metal and which shall be relatively hard and possess superior wearing qualities.

I further desire to provide a process whereby my improved alloy may be made.

In carrying out my invention I first provide an intimate mixture consisting of sal-ammoniac or salt and potash in about the proportions of one pound of the former to one ounce of the latter. I then melt about twenty pounds of spelter or zinc and while maintaining this at its melting heat add to it about eighty pounds of tin. Said tin should be added in small quantities, and the spelter should be maintained at its melting heat until the tin is completely incorporated with it. While this metallic mixture of tin and zinc is maintained at its melting heat, I add about four ounces of the first mixture, stirring the whole thoroughly until all fumes have disappeared. The crucible containing the resulting compound is then removed from the furnace and the metal poured into relatively small ingots. This compound I shall hereafter refer to as the "foundation metal." I then melt about twenty pounds of copper, and while maintaining this at its melting heat I add to it about three pounds two ounces of the foundation metal, while constantly stirring the whole. The furnace is now closed, and after the metal has been heated or cooked for about ten minutes it is removed and after a thorough stirring is poured into ingots. While this resulting metallic compound may be employed as a final or finished product, I have found that the best results are secured by making another lot of the alloy and adding to it while at its melting heat an amount of the first batch obtained equal in weight to about one-half of that of the second batch. This metal of the first batch should be added in small quantities while the second batch is maintained at its melting heat. The resulting final com-

pound should then be heated to a relatively high temperature before removal from the furnace and stirred thoroughly before pouring into molds.

I have found under practical conditions in making successive batches of my improved alloy that the most satisfactory results are secured if after a batch has been made which consists of sal-ammoniac, potash, tin, zinc, and copper, as above described, there be added to it one-half of its weight of previously-prepared alloy such as is always on hand from the gates of previous castings.

I claim as my invention—

1. The process which consists in adding a mixture containing sal-ammoniac and potash to a mixture of zinc and tin, and then combining said mixture with copper, substantially as described.

2. The process which consists in adding a mixture of sal-ammoniac and potash to a mixture of tin and zinc, adding the resulting compound to a body of copper, and finally mixing the resulting alloy with a body of previously-made alloy having substantially the same composition, substantially as described.

3. The process which consists in adding a mixture of a chlorid and a hydrate of an alkali metal or metals to a mixture of tin and zinc, and then adding the resulting compound to a body of copper, substantially as described.

4. The process which consists in adding tin to melted zinc in about the proportion of four parts of the former to one of the latter, adding to the resulting mixture a mixture consisting of a chlorid and a hydrate of an alkali metal or metals in the proportion of one pound of the former to one ounce of the latter, then adding to a body of melted copper an amount of the resulting compound in about the proportion of twenty pounds of copper to three pounds two ounces of said compound, substantially as described.

5. The process which consists in adding tin to melted zinc in about the proportion of four parts of the former to one of the latter, adding to the resulting mixture a mixture consisting of a chlorid and a hydrate of an alkali metal or metals in the proportion of one pound of the former to one ounce of the latter, then adding to a body of melted cop-

per a body of the compound previously formed in about the proportion of twenty pounds of copper to three pounds two ounces of the latter, and finally adding to the alloy  
5 a body of previously-made alloy in the proportion of two parts of the former to one of the latter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED H. SMITH.

Witnesses:

ROBERT KAISER,  
JOS. H. KLEIN.