

# UNITED STATES PATENT OFFICE.

I. S. HILL, OF BOSTON, AND J. DIXON, OF TAUNTON, MASSACHUSETTS.

IMPROVEMENT IN METALLIC COMPOSITIONS FOR BEARINGS OF MACHINERY, &c.

Specification forming part of Letters Patent No. 3,896, dated January 31, 1845.

*To all whom it may concern:*

Be it known that we, INCREASE S. HILL, of Boston, in the county of Suffolk and State of Massachusetts, and JOSEPH DIXON, of Taunton, in the county of Bristol and State aforesaid, have discovered a new and useful Metallic Composition for the Bearing and Wearing Surfaces of Machinery, or a new and useful method of preparing zinc so that it may be used for such bearings and surfaces; and we do hereby declare that the following is a full and exact specification of the several ingredients and their proportions, and of the manner of admixing or compounding the same, as well as the claim for which we solicit Letters Patent.

Our composition consists mostly of zinc (which, as is well known, belongs to the class of cheaper metals) hardened by being compounded with what we denominate a "hardening composition." This latter composition is formed of the following metals mixed in a state of fusion in the proportions hereinafter specified—viz., fifteen parts of tin to thirty-two parts of copper.

This composition, in a state of fusion, is to be admixed with molten zinc and tin (although tin is not absolutely essential) in the proportion of two parts of the said hardening composition to nineteen parts of zinc and from three to five parts of tin, according to the peculiar purpose for which the composition is to be used, the tin specified as to be added last having the tendency to render the compound, when cold, more or less ductile, according to the quantity

of the same incorporated therewith. The metal formed without the addition of the last-named proportion of tin, when broken, will have the appearance of cast-steel of a coarse quality; but the addition of the tin will make it stronger and cause it to be finer in grain, until four parts of the same be added, when the appearance of the metal, on its being broken, will be like that of fine cast-steel, and more closely resembling the same than any other metal.

The great strength of the composition, combined with a certain degree of softness which it possesses, renders it highly useful in the construction of bearings for rubbing surfaces of machinery, as it is capable of resisting for a great length of time the effects of wear and attrition. The large proportion of zinc used in forming the compound renders its use in the mechanic arts much less expensive than the metals ordinarily employed for these purposes, the cost being much less than any other composition where copper and tin are the principal metals used.

What we claim as our discovery, and desire to have secured to us by Letters Patent, is—

The composition or compound metal formed by the admixture of the above-specified proportions of zinc and of the hardening composition above described, whether tin be superadded in the proportions stated or not.

INCREASE S. HILL.  
JOSEPH DIXON.

Witnesses:

EZRA LINCOLN, Jr.,  
H. A. BREED, Jr.