

# UNITED STATES PATENT OFFICE.

OLIVER HOLDEN, OF NEW YORK, N. Y.

IMPROVEMENT IN ALLOYS FOR PREVENTING INCRUSTATION UPON METALS.

Specification forming part of Letters Patent No. **169,810**, dated November 9, 1875; application filed March 11, 1874.

*To all whom it may concern:*

Be it known that I, OLIVER HOLDEN, of the city, county, and State of New York, have invented certain Improvements in Alloys for Preventing Incrustations upon Metals, &c., of which the following is a specification:

This invention relates to a new and improved alloy of metals for the prevention of incrustation upon iron or other metals, and is designed principally to prevent deposits in boilers and other vessels while using water impregnated with lime.

The invention consists in a compound or alloy of zinc, tin, lead, bismuth, and antimony, mixed together in the following proportions, viz: Zinc, one hundred and ninety-four parts; tin, fifty-eight parts; lead, twenty-six parts; bismuth, eighteen parts; antimony, sixteen parts. These are combined, forming an alloy, by melting them together, or by melting separately and mixing the same.

The alloy or composition is used by applying it in the form of rivets or bolts inserted in various portions of the boiler, or in the shape of rings, bands, or plates, which are hung upon the tubes or flues of the boiler, or

otherwise fastened to the same in any convenient manner.

I am aware that a combination of tin and zinc has heretofore been employed, and which, under some circumstances, will produce beneficial results; but a combination of such metals may produce electrical action in certain solutions without preventing injurious deposits—as, for example, in certain lime-waters, such as the Croton of New York, lime will be deposited, even when tin and zinc may be combined and applied as above stated; but with the addition of lead, bismuth, and antimony, as in the present invention, such deposit will be prevented, even though the impregnation with lime be very great.

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

An alloy for preventing incrustation upon metals, consisting of zinc and tin, lead, bismuth, and antimony, in the proportions set forth.

OLIVER HOLDEN.

Witnesses:

JOHN W. RIPLEY,  
BOYD ELIOT.