

UNITED STATES PATENT OFFICE.

HELEN L. MACKER, OF BOSTON, AND GEORGE W. MARSTON, OF CAMBRIDGE,
MASSACHUSETTS.

IMPROVEMENT IN ALLOYS FOR HARDENING IRON.

Specification forming part of Letters Patent No. **133,237**, dated November 19, 1872.

To all whom it may concern:

Be it known that we, HELEN L. MACKER, of Boston, in the county of Suffolk and State of Massachusetts, and GEORGE W. MARSTON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a certain Compound for Hardening the Surface of Iron, of which the following is a specification:

The nature of our invention consists in the compound below described; said compound to be mixed with iron in a melted state, and to take the place of the chilling process.

To prepare our compound, mix, in a melted form, three pounds tin, one pound iron, four ounces copper, one-half ounce aluminum, one-fourth ounce quicksilver; mix from one-eighth to one-quarter of a pound of the above compound with five pounds cheap iron, in a melted form. The greater the proportion of the compound mixed with the iron, the deeper from the surface does the hardening process ex-

tend. In some instances it will be better to omit a part or the whole of the "pound of iron" in the above compound. This compound will make the surface of about the hardness of hardened steel, and fully equal to steel in other respects. The surface will not rust, but will retain its color and brilliancy. These are our advantages over the old process of chilling iron.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

The above-described compound, substantially in the proportions and for the purpose specified.

HELEN L. MACKER.
GEORGE W. MARSTON.

Witnesses:

WILLIAM B. BARRETT,
HENRY W. WILLIAMS.