UNITED STATES PATENT OFFICE.

WILLIAM H. KIMBALL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN REFINING IRON AND STEEL.

Specification forming part of Letters Patent No. 116,065, dated June 20, 1871.

To all whom it may concern:

Be it known that I, WILLIAM H. KIMBALL, of Boston, in the county of Suffolk and State of Massachusetts, have made an invention of certain Improvements in the Process of Refining Iron or Steel; and do hereby declare the following to be a full, clear, and exact description thereof, sufficient to enable others to make and use the same.

My invention as herein explained consists in the employment, in proper proportion, with the ordinary arbors or fluxes used in refining iron, of the chemical salt known as bromide of potassium. This salt of bromide of potassium is to be employed with lamp-black or charcoal, manganese, and iron, these latter being the component elements now usually adopted in refining iron.

In carrying my invention into effect I combine together bromide of potassium, in quantity about twenty grains; lamp-black or charcoal, about thirteen ounces; manganese, about six ounces; iron, about one hundred pounds; and melt these ingredients in a crucible in the ordinary manner, the result being a steel of good quality, hard, fine-grained, and resonant.

The proportion of the constituents named may be varied somewhat, according to the character of the steel required.

Under some circumstances, as the varying character of the iron employed may render desirable, I make use, in combination with the above-named ingredients, of a small proportion of cyanide of potassium, and of pulverized fluor-spar, to aid the fusibility of the flux, and to cause the scale to separate from the surface of the steel.

I am aware that the iodide of potassium has formerly been employed in the process of refining iron, but this material is expensive, and I have found that, in addition to being much cheaper, the bromide of potassium, (which is a different salt,) owing to its greater volatility, surely and effectually carries off the impurities of the iron and fluxes. For this and other reasons the steel made by the use of the bromide has been found to be considerably tougher and finer grained than when made by the iodide.

Claim.

I claim—

The employment of the bromide of potassium, in combination with the ordinary carbons and fluxes used in the process of producing iron or steel.

WILLIAM H. KIMBALL.

Witnesses:

EDW. GRIFFITH,

FRED. CURTIS.