

# United States Patent Office.

JOHN DE WITT WILLIAMS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR  
TO HIMSELF AND JOHN WILSON BUTLER, OF SAME PLACE.

*Letters Patent No. 104,091, dated June 7, 1870.*

## IMPROVEMENT IN THE MANUFACTURE OF IRON.

The Schedule referred to in these Letters Patent and making part of the same.

I, JOHN DE WITT WILLIAMS, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improvement in the Manufacture of Iron, of which the following is a specification.

### *Nature and Object of the Invention.*

My invention consists in treating pig-iron, during the process of boiling or puddling, with a composition composed of litharge, common salt, and fresh slaked lime, for the purpose of depriving the metal of its carbon and other impurities, and of thus producing wrought iron of superior quality.

### *General Description.*

For treating one ton of pig-iron, the ingredients are combined in the following proportions and quantities:

Litharge, four pounds.

Common salt, one pound.

Lime, eight pounds.

As it is unusual, however, to treat more than five hundred pounds or about one-quarter of a ton of pig-metal, at one "heat," in converting it into wrought iron, but one-quarter of the above must be used, the same proportions, or nearly the same proportions being, however, preserved.

In preparing the composition for use, the litharge and salt, in the proper proportions, are mixed together dry, and are then thoroughly dampened, and permitted to stand for about twenty-four hours.

The lime is not slaked until it is required for use, when it is immediately mixed with the combined litharge and salt, the whole being then thrown into the furnace, upon the mass of molten pig-metal to be treated, and thoroughly mixed with the same.

A violent ebullition will ensue, during which the metal will be deprived of its carbon and impurities, such as phosphorus, sulphur, &c., the iron thus produced, as I have ascertained by repeated tests, being tough, malleable, and equal in quality to the best refined wrought iron.

The above proportions may in some cases be varied, this depending upon the nature of the metal to be treated, but it is necessary in every case that all the ingredients should be used.

### *Claim.*

The treatment of iron during the process of boiling or puddling, with a composition consisting of litharge, salt, and lime, combined substantially in the manner described.

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

JOHN DE WITT WILLIAMS.

Witnesses:

F. B. RICHARDS,  
HARRY SMITH.