

UNITED STATES PATENT OFFICE.

WILLIAM FIELDS, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN THE MANUFACTURE OF IRON.

Specification forming part of Letters Patent No. **102,797**, dated May 10, 1870.

To all whom it may concern:

Be it known that I, WILLIAM FIELDS, of the city of Wilmington, in the State of Delaware, have invented an Improved Process in the Manufacture of Iron, of which the following is a specification.

The nature of the invention consists in two chemical compounds, one of which is thrown into the ordinary puddling-furnace with its damper partly closed and while the iron is in the boiling process, and after sufficient time has elapsed to allow the compound to become incorporated with the molten iron the other is thrown into the mass, and as soon as it is incorporated with the boiling iron the damper is thrown open, the iron grained and balled, and put through the hammer or rollers, as desired.

The object of this invention is by means of the compound first used to eliminate the sulphur and phosphorus and produce a neutral iron, and by means of the second compound to produce an iron superior in quality and toughness to the ordinary charcoal-iron.

I charge the puddling-furnace with four hundred and fifty pounds of any two or three kinds of pig-iron, fifteen pounds of Franklinite iron, and fifteen pounds of Canada iron ore. When the iron is undergoing the puddling or boiling process I cast into the furnace the following compound, which must be thoroughly mixed—that is to say: two pounds of English sal-soda, one pound of sal-ammoniac, two ounces of magnesia, and eight ounces of litharge. When this mixture has been thoroughly incorporated with the boiling iron I cast into the furnace another compound composed of two pounds of chromate of iron, four ounces of wolfram, four

ounces of manganese, two quarts of pulverized charcoal thoroughly mixed, and allow it to become incorporated with the molten iron, then raise the damper, and the iron is ready for graining, balling up, and to be put through the hammer or rollers.

I do not claim broadly the use of chromate of iron and wolfram in the compound for making iron; nor do I claim the use of Franklinite iron and Canada iron ore, as they have been heretofore used in the treatment of iron; but I claim as my invention—

1. The employment of magnesia when used substantially as and for the purposes hereinbefore set forth.

2. The employment of sal-ammoniac in the process of making iron.

3. The combination of English sal-soda, sal-ammoniac, magnesia, and litharge, when used in the process of treating iron, as hereinabove described, in about the quantities specified, and prepared in the manner and form mentioned, and for the purposes set forth.

4. The process of treating iron during the puddling or boiling process with a chemical compound composed of chromate of iron, wolfram, manganese, and pulverized charcoal, in about the quantities specified, and prepared and used in the manner and form described, and for the purposes set forth.

5. The whole process of treating iron for the purpose aforesaid, as hereinabove fully set forth and described, and for the purposes mentioned.

WILLIAM FIELDS.

Witnesses:

CHARLES Y. SMITH,
SAMUEL J. BUCK.