UNITED STATES PATENT OFFICE.

WILLIAM HENRY DAWES, OF WEST BROMWICH, ENGLAND.

IMPROVEMENT IN THE MANUFACTURE OF IRON.

Specification forming part of Letters Patent No. **42,899**, dated May 24, 1864.

To all whom it may concern:

Be it known that I, WILLIAM HENRY DAWES, of Bromford Iron-Works, West Bromwich, in the county of Stafford, England, ironmaster, a subject of the Queen of Great Britain, have invented or discovered certain new and useful Improvements in the Manufacture of Iron; and I, the said WILLIAM HENRY DAWES, do hereby declare the nature of the said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof—that is to say:

My invention consists, first, in introducing such a quantity of refined iron in a melted state into the puddling-furnace as will be sufficient to make only one ball of iron, say, of about one hundred and twenty pounds weight, more or less. The skill and labor of the puddler required to separate the larger quantity commonly made use of (of about four hundred and eighty pounds in weight) into four, five, or six balls is in great part dispensed with.

My invention consists, secondly, in the combination of the processes of the blast-furnace, the refinery, and the puddling-furnace, so that the iron from the blast-furnace may be run direct into the refinery, and, when sufficiently refined, conveyed into the puddling-furnace by means of ladles or other means suited to the purpose.

Having explained the nature of my invention, I will proceed to describe the manner in which the same is to be performed.

In carrying into effect the first part of my invention I proceed as follows: I refine, in any ordinary refinery, the iron which is to be converted into wrought or malleable iron. The refinery process is conducted in the usual manner, and when the iron has been sufficiently refined I run a quantity of the refined iron from the refinery into a lage ladle of the kind commonly used in iron-foundries. The melted refined iron is poured from the said large ladle into smaller ladles, the said smaller ladles being sufficiently large to hold the quantity of melted refined iron required to make a ball of wrought or puddled iron of the ordinary size. The quantity of melted refined iron which I pour from the larger ladle into each of the smaller ladles is about one hundred and twenty pounds, more or less. The melted refined iron in each of the smaller ladles is conveyed to a separate puddling-furnace, of the ordinary kind, where the puddling process is performed upon it, and it is converted into wrought or malleable iron in the ordinary manner. As the quantity of iron operated upon at one time in each puddling-furnace is only sufficient to make one ball of the ordinary size, and as the said iron has been to a great extent decarbonized in the refinery before its introduction into the puddling-furnace the puddling operation occupies but little time. The wrought or malleable iron produced is of better and more uniform quality than that produced by the ordinary method of conducting the puddling process. More wrought or malleable iron is produced in a given time and less skilled labor is required in its production than in the ordinary method of puddling.

In carrying into effect the second part of my invention—that is, the combination of the blast-furnace, the refinery, and the puddling-furnace—I build the blast-furnace and refinery in such proximity and on such different levels that the cast-iron smelted in the blast furnace may run direct from the blast-furnace into the refinery, from whence, after it has been properly refined, it may be conveyed to the puddling-furnace in a melted state by means of ladles and converted into wrought or malleable iron, as hereinbefore described. I build the puddling-furnace where convenient in such proximity to the refinery that the distance through which the melted refined iron has to be carried from the refinery to the puddling-furnace is made as short as possible. By thus combining the blast-furnace, refinery, and puddling-furnace the manufacture of wrought or malleable iron from cast-iron may be conducted with great rapidity and with a minimum amount of skilled labor.

Having now described the nature of my invention and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described, as the same may be varied without departing from the nature of my invention; but

I claim as my invention—

1. Manufacturing wrought or malleable iron by puddling refined iron conveyed in a melted state from the refinery to the puddling-furnace, the quantity of the melted refined iron operated upon at one time in each puddling-furnace being only sufficient for the manufacture of one ball of wrought or malleable iron.

2. Combining the blast-furnace and refinery and puddling-furnace used in the manufacture of iron, substantially as herein described.

WILLIAM HENRY DAWES.

Witnesses:
RICHARD SKERRETT,
GEORGE SHAW.