

UNITED STATES PATENT OFFICE.

DAVID A. MORRIS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF SHEET-IRON.

Specification forming part of Letters Patent No. **31,184**, dated January 22, 1861.

To all whom it may concern:

Be it known that I, DAVID A. MORRIS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Sheet-Iron; and I do hereby declare that the following is a full and exact description thereof.

The object of my invention is to form an enamel on the surface of sheet-iron, to lessen its tendency to corrosion and give it a highly improved finish.

I require the sheets, in the first place, to be rolled to the proper size and weight with a thin uniform coat of ferrate of iron, commonly called "black oxide"—"iron scale." Ferrate of iron is a compound of protoxide and sesquioxide, according to the chemical configuration $\text{Fe}-\text{Fe}=\text{FeO}+2\text{Fe}_2\text{O}_3$, the former being the base and the latter the acid. Now, by converting this ferrate of iron into a protocarbide of iron (FeOC) we have a compound that is almost as incorrodible as platina or gold, and capable of receiving a very fine polish. To effect this change in the nature of the ferrate of iron, and at the same time produce the finish desired, I manipulate the iron in manner as follows, viz: Taking the sheets of iron with the ferrate of iron on them, I apply a coat of coal-oil or petroleum. (Carbon in any other convenient form will do as well.) Then I place as many of the sheets thus prepared—say twenty-five or thirty—in a straight-sided pan-like case, a section of which appears thus: . Then, after putting on another sheet to constitute the lid, I turn over the edges of the case, thereby forming a close box, a section of which appears thus: .

Then I place the whole in a muffle, to be heated to about 900° Fahrenheit. Then I hammer the pack—case and sheets—with a large-faced steam-hammer, which should strike a blow of two hundred and fifty to three hundred pounds to the square inch of the hammer-face, and should run at least one hundred blows per minute. If the hammering is continued until the iron is cool enough to bear the hand on it, it will have received a beautiful glossy enamel of the character above described, and so thoroughly incorporated with the iron that it may be worked into intricate shapes without scaling off.

Hammering hardens the iron, so that it requires annealing afterward, and it is difficult to hammer a large package of sheets entirely straight. They are likely to be more or less buckled. I therefore arrange a number of sheets in a case the same as for hammering, and as soon as the packing is properly heated, which can be done without effecting the polish of the enamel, I place it in a powerful press to cool. By this means I anneal sheet-iron much quicker and cheaper than it is done by the only other method now in use, and am enabled at the same time to remove all kinks or buckle.

What I claim as my invention, and desire to secure by Letters Patent, is—

The application of carbonaceous material prior to heating the iron, (without removing the iron scale or black oxide from the surface of the sheets,) and for the purpose specified.

D. A. MORRIS.

Witnesses:

THOS. OWSTON,
JAS. MCGARGILL.