

UNITED STATES PATENT OFFICE.

ISAAC E. CRAIG, OF CAMDEN, OHIO.

IMPROVEMENT IN THE MANUFACTURE OF SHEET-IRON.

Specification forming part of Letters Patent No. **103,577**, dated May 31, 1870.

To all whom it may concern:

Be it known that I, ISAAC E. CRAIG, of Camden, in the county of Preble and State of Ohio, have invented a new and Improved Method of Manufacturing Sheet-Iron; and I do hereby declare the following is a full and exact description thereof.

The nature of my invention consists in giving to the iron, when in plates or sheets, a capacity for brilliant and permanent polish by reviving the metal of the oxide upon its surface in such a manner that the revived metal will adhere as a coating or film upon the surface of the sheets or plates.

To enable others skilled in the art to avail themselves of my invention, I will proceed to describe the method of its application.

The iron used should be as free from sulphur as can easily be obtained, and, in drawing down from bars to plates or sheets of a thickness equal to about twice that at which it is desired to have the iron finish, attention should be given to so heating and exposing to the air all the surfaces that they may alike acquire a considerable thickness of oxide, the exact degree to which the sheets or plates are oxidized being unimportant; but in all cases it is necessary that the colors, light blue, violet, yellow, straw color, &c., incident to a slight degree of oxidation of iron, shall have disappeared and given place to black, dark blue, brown, or red.

When the sheets or plates are reduced to a thickness equal to about twice that to which they are desired to finish, I prefer to have them sheared to a uniform size and shape. They are then ready to be deoxidized—a process which I conduct by heating them to a degree and for a length of time sufficient, in contact with a deoxidizing agent, to revive the metal of their coating of oxide. For this purpose I do not confine myself to any particular deoxidizing agent. The several forms of carbon, many other simple and compound solids, and a number of gases may be used for this purpose.

In practice, I prefer to heat the plates or sheets in contact with finely-pulverized charcoal. The plates or sheets should be laid

down, singly, at some place convenient to the heating-furnace, and covered, by sifting, with a thickness of charcoal-dust amply sufficient to combine with all the oxygen contained in the oxidized surface of the sheet, an excess doing no injury, and being preferable to an insufficient quantity, even one-sixteenth of an inch being a good thickness for the charcoal-dust on each sheet. Another sheet of iron is then laid on this, charcoal-dust applied as before, and the same process repeated until a pile or pack is made up as large as suits the capacity of the furnace or convenience of handling. This, when placed in the furnace, should be raised to a degree of heat a little short of the lowest welding-heat, or that bright redness at which oxide of iron becomes semi-fluid, and maintained at this heat for from ten to fifteen minutes. If this heat be exceeded, the revived metal will flow and surface of the sheets become carbonized, which should be avoided. During this time the furnace should be so regulated in draft and firing as to give to the flame something of a deoxidizing character, as indicated, in a measure, by the smoky or clouded appearance of the gases in the furnace. After this the iron is withdrawn from the furnace, cleansed from adhering charcoal by shaking the sheets, when, if the operation has been properly conducted, the plates or sheets will have the color of clean metallic iron, being covered with a coat of non-fibrous, somewhat brittle, and easily-polished metal. They may then be drawn down to the desired gage and polished by passing them, in packs, at a very gentle red or high black heat, several times between the rolls, care being had, after heating the sheets with charcoal, as described, not to oxidize the sheets as deeply as was done before.

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

The preparation of iron for being polished in sheets by reviving the metal of the superficial oxide.

ISAAC E. CRAIG.

Witnesses:

C. M. ROHRER,
A. G. ROHRER.