

United States Patent Office.

W. DEWEES WOOD, OF McKEESPORT, PENNSYLVANIA.

Letters Patent No. 61,034, dated January 8, 1867.

IMPROVED PROCESS OF TREATING CLEANED OR SCALED IRON.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, W. DEWEES WOOD, of the borough of McKeesport, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improved Process for Treating Cleaned or Scaled Iron; and I do hereby declare the following to be a full, clear, and exact description thereof.

When sheets, plates, or bars of iron are rolled at or above a red heat, a scale forms upon the surface of the metal, which is an oxide of iron which is very hard and brittle, and which it is necessary to remove in order to prepare the iron for polishing, coating with other metals, or finishing in any other way. This scale is removed by immersing the iron in an acid bath, after which it becomes necessary to remove, as far as possible, all trace of the acid from the metal, which is usually done by passing it through an alkaline bath, the effect of which is to neutralize the acid. The iron is then washed in water in order to free it from the alkali, which would otherwise form a coating on its surface. As it is very essential to prevent the formation of rust on the surface of the iron, it is washed in hot water, and allowed to remain therein until it becomes thoroughly heated, so that when removed from the water it may dry very quickly.

The process of destroying the effect of the acid on the surface of the iron, which I have described, does not perfectly accomplish the desired result. Iron thus heated is found to rust very rapidly when exposed to a damp atmosphere, which is caused, as I have discovered, by the presence in the pores of the iron of a small quantity of acid which the alkaline bath and subsequent washing have failed entirely to remove. On examining plates of iron immediately after they become dry, after the final washing with water in the process I have described, with a microscope, I have discovered that small particles of rust, about as small as the point of a fine needle, form on the surface of the iron as soon as it is exposed to the air, which I suppose to indicate that traces of the acid still remain in the pores of the iron. The fine rust thus formed, although not perceptible to the naked eye, is sufficient to close up the pores of the iron and prevent the evaporation of the acid, which, whenever the iron is exposed in a damp place, shows itself in its effect of producing the oxidation of the metal until it becomes completely worthless.

The object of my invention is to prevent the closing of the pores of the iron with fine particles of rust, and to effect a more thorough removal of all traces of acid from iron which has been passed through an acid bath for the purpose of cleansing and scaling.

To enable others skilled in the art to make use of my improvement, I will proceed to explain more fully the nature of my process, and the manner in which it is practically applied.

After the iron has been scaled or cleaned in the acid bath, and the acid has been neutralized as far as practicable by the alkaline bath, I wash it, as before described, in water hot enough to heat the iron sufficiently to cause it to become apparently dry almost immediately after its removal from the water. As soon as it is taken out of the hot-water bath, the iron is placed in an oven or chamber, heated with hot air, or otherwise, to a temperature sufficient to evaporate all fluids from the pores of the iron, but not nearly hot enough to make it red hot, or to affect it injuriously. In this hot-air oven the iron remains long enough to remove all traces of the acid from the pores of the iron, which it will do provided the iron is removed immediately from the hot-water bath into the hot-air oven, so as to give no time for the formation of rust to close the pores of the metal. From the hot-air oven the sheets, plates, or bars of iron are taken, and, while yet hot, and before the pores of the metal have become closed, they are plunged into a bath composed of a mixture of oil and spirits of turpentine, or of the latter fluid alone, for the purpose of permeating the pores of the iron with this fluid, and leaving a very light coating or film upon its surface, which will effectually protect the iron from further oxidation, and leaves it in a fitting condition for coating it with other metals, or for polishing, or for any other purpose where iron is required with a surface freed from scale. In place of turpentine, benzine may be used to mix with the oil, or any other fluid which will mix with it to make it sufficiently thin to leave a very slight film or coating on the surface of the metal, which film should be so thin as not to make the metal feel greasy to the touch. Any greasy or fatty oil may be used; and the proportion which I think best is about ten per cent. of oil and ninety per cent. of turpentine or benzine. If benzine be employed, it should not have been treated with acid, as is usually done in purifying petroleum, as the acid in the benzine would injure the iron.

The oven or air-chamber may be constructed in any convenient manner, so as to be capable of being heated to the proper temperature without exposing the metal to the direct action of or contact with the fire.

Having thus described my improved process of treating iron which has been cleaned or scaled in an acid bath, what I claim as my invention, and desire to secure by Letters Patent, is—

The process hereinbefore described of subjecting the iron, immediately after it has been washed in water to remove the remains of acid or alkali, to a hot-air bath in a suitable oven or chamber, heated to a low temperature sufficient to evaporate all fluids from the pores of the metal, and then, while the iron is yet hot, immersing it in, or coating it with, a mixture of oil and turpentine, or other similar fluid or mixture which will leave a very slight film or coating on its surface, for the purpose hereinbefore described.

In testimony whereof I, the said W. DEWEES WOOD, have hereunto set my hand in presence of—

W. DEWEES WOOD.

Witnesses:

A. S. NICHOLSON,
W. BAKEWELL.