

# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN METHODS OF PROTECTING IRON FROM OXIDATION.

Specification forming part of Letters Patent No. **24,604**, dated June 28, 1859.

*To all whom it may concern:*

Be it known that I, EBENEZER G. POMEROY, of the city, county, and State of New York, in the United States of North America, have invented, discovered, and applied a new and useful method or process for protecting iron from oxidation and beautifying its surface by incorporating flexible matter therewith, of which the following is a specification.

This application for Letters Patent has no reference whatever to the mode of proceeding to accomplish the object above stated as described by me in the specification to certain other Letters Patent obtained by and issued to me for a similar purpose, bearing date the 31st day of January, in the year of our Lord 1854, and may be looked upon as a distinct and separate application and specification.

In order to enable others skilled in metallurgy to fully understand how to make use of and apply this invention or discovery, I give the following description of the mode or process used by me, to wit:

First. I take iron in slabs or sheets not yet fully extended to the desired length and thickness—that is to say, if I wish to finish it to wire-gage 26, I would use gage 20, and in similar proportion for lighter or heavier iron—and having a vat made of plank, lined with sheet-lead, of suitable width and depth to correspond with the said slabs or sheets, so as to admit of their being set up edgewise. I place them therein in that manner and fill up the vat with diluted acid of sufficient strength to remove the oxide scale from the iron, leaving a bright, clean surface. Then, taking out the said slabs or sheets, I set them up in the open air, for the express purpose of allowing them to oxidize or corrode, carefully watching this process until the entire surface of the iron has become completely and evenly oxidized and roughened, when it will be covered or filled with innumerable minute cavities and corresponding minute protuberances.

Second. I take these corroded and roughened slabs or sheets of iron and immerse them in another vat filled with a solution of oak-bark or of Aleppo galls and bark containing tannin, for the purpose of bringing into juxtaposition gallic acid, tannin, and oxide of iron, thereby changing the color of the surface

of the iron and forming a solid substance by chemical combination therewith. A deep black or blue-black color may be thus produced. The slabs or sheets of iron are then dried, when they are ready for the next process, to wit:

Third. Having prepared a fire-proof paint composed of pure plumbago and bituminous lamp-black or other dark fire-proof flexible matter, ground fine and moistened with beer or milk to a proper consistency, I thoroughly paint the said slabs or sheets with the same, using a stiff brush, so as to effect a complete incorporation of the material with the corroded surface of the iron, spreading the same evenly over such surface.

Fourth. For the purpose of completing and perfecting the incorporation of the paint and the substance formed by process second, as above set forth, with the corroded surface of the iron, rendering the whole completely interlocked together, after heating the said slabs or sheets so prepared, as above stated, and thereby expelling any portion of acid that may remain undisposed of during the former processes, I pass one piece at a time between perfect-chilled rollers, polished, by the mechanical force of which a perfectly-smooth surface is produced, and the protuberances before mentioned become flattened and clinched into the under surface of the pellicle of fire-proof paint, thereby holding such pellicle or outer covering firmly interlocked, so that the finest joints can be made without scaling. As during the latter part of this process the slabs or sheets may pass through the rollers after becoming cold, the iron, unless the same be best charcoal-bloom, will require to be annealed, which should be done with a heavy weight, in a cast-iron box, in a close furnace. Thus I effect the production of sheet-iron firmly covered with a pellicle of fire-proof paint, not easily oxidized, and capable of receiving a high polish, which polish may be obtained by passing the sheets between swiftly-revolving brushes or otherwise.

I do not claim the cleansing of the iron by acid, nor the discovery that iron will oxidize, nor that gallic or tannic acid will color the salts of iron, nor the fire-proof paint, nor the process of rolling above described; but

What I do claim as my invention and dis-

covery, and desire to secure by Letters Patent, is—

The preparation of iron by corroding or oxidizing its surface for the express purpose of making the same rough and capable of being closely and firmly united with a covering of fire-proof paint by means of rolling or other

mechanical force, and the application of the other processes above described to iron so prepared, in combination therewith.

EBENEZER G. POMEROY.

Witnesses:

WM. P. CHAMBERS,

DANIEL POMEROY.