UNITED STATES PATENT OFFICE.

JAMES ANTHONY GRAHAM, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

COVERING IRON WITH LEAD.

SPECIFICATION forming part of Letters Patent No. 280,466, dated July 3, 1883.

Application filed December 18, 1882. (Specimens.) Patented in England November 10, 1882, No. 5,367.

To all whom it may concern:

Be it known that I, JAMES ANTHONY GRAHAM, a subject of the Queen of Great Britain, residing at the city of London, in the county of Middlesex, in the United Kingdom of Great Britain, have invented certain new and useful Improvements in the Process of Covering Iron with Lead; and I do hereby declare the following to be a full, clear, and exact description of the same.

The object of my invention is to coat or cover the surface of iron with a layer of lead of any desired thickness for the purpose of protecting the iron from the action of water, or of any chemicals which have the power of attacking iron, but which have little or no action upon lead, in such a manner that the two metals shall be firmly united together.

I am aware that iron has heretofore been coated thinly with inferior metal by a process which essentially consists in first cleaning the surface of the iron; second, in applying thereto a flux; and, third, in immersion in a bath of the inferior metal in a molten condition. My invention differs essentially from the above in the heating of the iron to or above the melting-point of lead after the application of the flux, but before the application of the lead, whereby the flux is partly decomposed and the process facilitated, and also in the application of the lead in mass to the surface to be coated, whereby said coating may be made of any desired thickness.

The surface of the iron to be coated is first thoroughly cleansed from oxide or other impurities by any of the well-known methods, after which the piece of iron is placed, preferably, on a level surface in a heating-chamber; or it may be heated from the under side. A strong solution of what is commonly known as "chloride of zinc" (which may be acid or neutral) is caused to flow onto the surface to be coated, so as to completely cover the same, and the iron is then raised to a slightly higher temperature than that required to melt lead. Molten lead is then poured onto the surface to be coated, and the temperature maintained until the chlorides (which are visible on the surface in the form of a scum) cease to rise. This operation may be hastened by agitating the molten lead by any suitable means. The piece of iron is then allowed to cool, when the lead will be found solidified and firmly attached to the surface of the iron. The surface of the lead is then washed in order to remove the chlorides, and, if desired, the coated metal may be passed through rollers, so as to give a uniform and homogeneous surface to the lead covering.

I wish it to be understood that by the word "iron" I desire to include any of the various forms or conditions which such metal may assume—such, for example, as in its treatment by any suitable process for the production of steel; and the application of my invention will not be materially affected by any particular condition of the metal, even when alloyed with other metals, in which latter case it will only be necessary to treat the surface to be coated with lead, so that a practically-pure surface of iron may be exposed to the action of the chloride of zinc.

When it is necessary to coat a surface of iron that cannot conveniently be placed in a horizontal position, means will have to be provided whereby the lead may be retained in its position while in the molten state and until it has become solid.

When it is desired to make a lead joint between two iron surfaces, the surfaces will be treated in a similar manner and the lead caused to adhere to both, as above described.

Instead of using a solution of chloride of zinc, the same may be applied in a solid form, and after it has been fused the lead might also be placed on the heated surface, to be coated in a solid form, if desired.

Having described the nature of my invention, I wish it to be understood that I do not confine myself to any special mode of carrying the same into effect; but

What I claim is—

The method of coating iron with a covering of lead of any required thickness, which consists in cleaning the surface of the iron, then covering the same with chloride of zinc, and then raising the temperature of such surface to or above the melting-point of lead, and applying a suitable quantity of lead thereto and allowing it to remain thereon until it has solidified.

In testimony whereof I have hereto set my hand this 1st day of December, 1882.

JAMES ANTHONY GRAHAM.

Witnesses:

CHARLES ARTHUR ALLISON,

H. WINKWORTH.