

UNITED STATES PATENT OFFICE.

FREDERICK F. FARNHAM, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO AMERICAN SHEET & TIN PLATE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

HOT PICKLING-BATH.

1,029,351.

Specification of Letters Patent.

Patented June 11, 1912.

No Drawing.

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To all whom it may concern:

Be it known that I, FREDERICK F. FARNHAM, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hot Pickling-Baths, of which the following is a specification.

This invention relates to a cleaning or pickling bath and flux for cleaning the surfaces and removing scale and other impurities from iron and steel articles preparatory to coating them with zinc, tin, lead, or other coating substances or alloys.

The object of the invention is to provide a bath which not only cleans the iron and steel articles, but also serves as a flux to secure a closer adhesion of the coating which is subsequently applied thereto.

The bath may be composed entirely of lead chlorid (PbCl_2) but preferably has added thereto a small amount of tin chlorid in order to lower its melting point. Lead chlorid alone well answers the purpose, but its melting point can be reduced and its fluidity increased and its viscosity reduced by the addition thereto of a small amount of tin chlorid, or, more strictly speaking, of stannous chlorid (SnCl_2). The amount of stannous chlorid can vary anywhere from zero to 25 per cent. of the whole. The lead chlorid is generally first melted and then the required amount of stannous chlorid thrown in. The articles to be cleaned are merely dipped into the molten mass and allowed to remain therein long enough to raise the metal articles to the same temperature as the bath. The time for this varies according to the bulk of the metal article and also with the temperature of such article before immersion. The lead chlorid possibly acts as an acid to combine as a whole with the scale or Fe_2O_3 , and forms a magnetic scum on top of the bath. Possibly a lead-iron oxy-chlorid is formed.

A thin coating of lead may be formed on the iron or steel article in the bath, or the surface simply cleaned leaving the bright iron covered with the constituents of the bath as a protection against oxidation when taken out and exposed to the air. This protective covering acts as a flux in the coating pot. The scum which is removed can be treated to recover the lead chlorid, so that there is no waste.

The bath is volatile at a high temperature but is not volatile at the temperature at which it is used if a draft of air is not permitted to blow over it, hence the loss by volatilization can be made small by a suitable mechanical design of the pot, and the use of condensing chambers.

The bath is comparatively inexpensive, due to the fact that the lead and tin chlorid can be readily recovered, and used over again. It thoroughly cleans the surface of the iron or steel articles from all scale and other impurities and leaves the same coated with a thin flux coating which greatly increases the adhesion of the coating substance applied to the article.

What I claim is:

1. A cleaning and fluxing bath containing molten lead chlorid.
2. A cleaning and fluxing bath consisting of molten lead chlorid and stannous chlorid.
3. A cleaning and fluxing bath consisting of molten lead chlorid and stannous chlorid, the latter not exceeding 25 per cent. of the whole.

In testimony whereof, I have hereunto set my hand.

FRED. F. FARNHAM.

Witnesses:

F. W. HUTTER,
MARY E. CAHOON.