UNITED STATES PATENT OFFICE.

ERNEST M. HEWETT, OF NEWTON, ASSIGNOR TO DANIEL W. CROSBY, TRUSTEE, OF BOSTON, MASSACHUSETTS.

PROCESS OF AMALGAMATING ZINC.

SPECIFICATION forming part of Letters Patent No. 385,309, dated June 26, 1888.

Application filed November 15, 1887. Serial No. 255,230. (No specimens.)

To all whom it may concern:

Be it known that I, ERNEST M. HEWETT, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in the Process of Amalgamating, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention has for its object the amalgamation of zinc, for battery purposes, in a novel manner, whereby the said zinc may be used a substantially long time without renewing.

Prior to my invention I am aware that zinc has been amalgamated by dipping it into a bath of mercury; and so also zinc and mercury mixed with baser metals—such as lead, tin, antimony, &c.—have been distilled, and the distillate collected and molded or otherwise formed into sheets to be used for battery purposes. When zinc is dipped into mercury, only a surface-coating of mercury on the zinc is effected, and the zinc thus amalgamated can only be used a substantially short time, owing to the oxidation of mercury. An amalgamated zinc, produced by distilling the zinc and mercury together, is effective for battery purposes, as the mercury is distributed throughout and commingled with the zinc, so that the oxidation of the mercury takes place less rapidly, thereby prolonging the life and usefulness of the zinc pole of the battery. The process of forming zinc amalgam in quantities sufficient for battery purposes by distillation is objectionable on account of the length of time required, the liability of loss of fumes, and the danger attendant because of the poisonous mercurial fumes.

It is the object of this invention to produce amalgamated zinc which shall be equally effective as the zinc amalgam produced by the distilling process, and that, too, in a very short time, without danger to the operator and without loss of material.

In accordance with my invention I employ the surface method of amalgamation, but charge, as it were, the zinc with mercury by means of water or a solution containing water, heated, preferably, to near the boiling-point. The heated water renders the zinc substantially malleable and more porous, so that the mercury on the surface of the said zinc enters the pores and permeates the body of the zinc.

To practice my invention, the zinc, which may be ordinary commercial zinc, is first cleansed by dipping into a caustic alkali, preferably caustic potash, and then into water containing about ten per cent. of acid, preferably hydrochloric acid or sulphuric acid. The zinc thus cleansed may in accordance with my invention be next amalgamated by dipping it into a bath of boiling water containing, preferably, ten per cent. of hydrochloric acid or sulphuric acid, and then into a bath of mercury. The zinc thus becomes coated with mercury, and the said mercury is driven into or caused to permeate the zinc by again dipping the amalgamated zinc into the boiling acidulated bath. This process of dipping alternately into a boiling acidulated bath and a bath of mercury will be repeated, preferably, five or six times to insure a substantially perfect amalgamation of the zinc and mercury. As the process of amalgamation is continued, the zinc is preferably permitted to remain a little longer in the mercury bath at each succeeding immersion in said bath.

I prefer the method just described; but instead of maintaining separate baths of mercury and acidulated water, the said baths may be made one and the zinc dipped or otherwise immersed therein, so as to cover the said zinc with mercury, the zinc thus amalgamated being then immersed in a bath of substantially boiling water.

I claim—

That improvement in the art or method of amalgamating zinc which consists, first, in coating the zinc with mercury and then subjecting the mercury-coated zinc to the action of water, or a solution containing water maintained substantially at the boiling-point of water, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST M. HEWETT.

Witnesses:

JAS. H. CHURCHILL,

B. DEWAR.