

United States Patent Office.

DAUPHIN S. HINES, OF BROOKLYN, NEW YORK, ASSIGNOR TO JOHN J. CROOKE, OF NEW YORK CITY.

Letters Patent No. 64,531, dated May 7, 1867.

IMPROVEMENT IN MAKING TIN-COATED FOIL.

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, DAUPHIN S. HINES, of Brooklyn, Kings county, and State of New York, have invented a new and useful Improvement in the Process of Making Tin and Lead-Foil; and I do hereby declare that the following is a full, clear, and exact description thereof.

Various processes have been invented for making foil of lead coated on the outer surfaces with tin. One of these processes which is practised consists in taking an ingot of lead of the length, width, and thickness required, placing it between two laminæ of tin, and by successive rollings weld the two metals and reduce the whole to the required thickness. This process is attended with serious difficulties. Another process consists in taking an ingot of lead of the required size and form, and coating it with tin to the required thickness by successive dippings in molten tin, and then subjecting this ingot so coated to successive rollings; but this is objectionable because of the liability of getting the tin of unequal thickness.

I avoid the objections to the above processes by my invention, which consists in taking tin pipe of the required length, diameter, and thickness of metal, placing it in ice water or any other cooling medium, and filling it with molten lead, and then rolling it in the usual manner to the thickness required for foil.

Tin melts at a temperature far below lead, and to prevent the molten lead from melting the tin pipe when poured in, the tin pipe must be surrounded by a suitable cooling medium to carry off the heat, and thus keep the temperature of the tin below the melting point until the lead inside solidifies.

For carrying my said improved process into practical operation I take tin pipe made in any of the known modes, and of a diameter and length and thickness of metal suited to the intended width and length of foil required, and of a thickness such as, when drawn out with the lead inside, will give the required thickness of lamina of lead and tin. I close one end of the said tin pipe and place it in a vertical position in any suitable vessel containing a refrigerating liquid, such as water with ice and salt, and when thus exposed to the influence of the cooling medium I fill the tin pipe with lead by pouring molten lead into it. During such pouring the tin is maintained at a temperature so low by the cooling medium that it will not be melted by the much higher temperature of the lead within it. So soon as the lead has solidified and been reduced to a temperature below the melting point of tin, the pipe so filled with lead can be taken out of the cooling medium and the mass of lead thus surrounded with tin is in a suitable condition for being reduced by repeated rollings between rollers to the thickness required for tin-foil. The rolling is to be done in the usual way generally practised in the manufacture of tin and lead-foil, and the tin and lead will be found to be perfectly united, however thin the lamina of tin and lead may be.

What I claim as my invention, and desire to secure by Letters Patent, in the process of making foil of lead coated with tin on both surfaces, is—

Forming the ingot by pouring molten lead into a tin pipe whilst immersed in a cooling medium, substantially as described, in combination with the after process of rolling, as set forth.

DAUPHIN S. HINES.

Witnesses:

GEO. W. GAGE,

A. DE LACY.