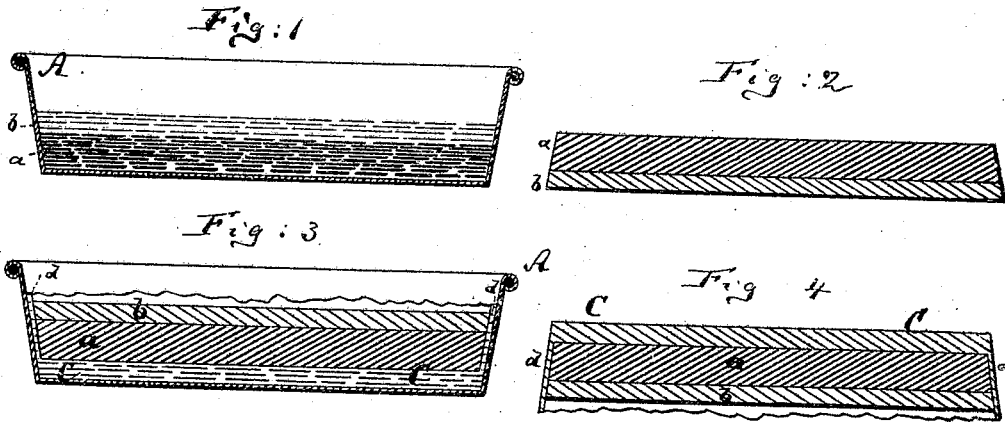


H. SELLING

ART OF MAKING TIN FOIL INGOTS.

No. 183,220.

Patented Oct. 10, 1876.



*Witnesses:*  
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*Inventor*  
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*by his attorney*  
*Dr. Briesen*

# UNITED STATES PATENT OFFICE.

HENRY SELLING, OF NEW YORK, N. Y., ASSIGNOR TO HELENA SELLING, OF  
SAME PLACE.

## IMPROVEMENT IN THE ART OF MAKING TIN-FOIL INGOTS.

Specification forming part of Letters Patent No. 183,220, dated October 10, 1876; application filed  
September 1, 1876.

*To all whom it may concern:*

Be it known that I, HENRY SELLING, of New York city, New York, have invented an Improvement in the Art of Making Tin-Foil Ingots, of which the following is a specification:

Figures 1, 2, 3, and 4 represent the ingot from which the foil is made in its various stages during manufacture.

Similar letters of reference indicate corresponding parts in all the figures.

This invention has for its object to improve the method of making tin-covered lead-foil, and also to improve the foil itself.

The invention consists, first, in a new manner of forming the ingot, so that the edges as well as the faces thereof will be lined with tin; secondly, in the new ingot thus made; and finally, in a new composition of the ingot.

In making the ingot, I first pour molten lead, which is mixed with about two per centum by weight of bismuth, into a mold, A, producing thus a layer, *a*, of which the thickness depends upon the character of the rolling machinery and upon the relative required thickness of the lead in the perfect foil. Before the lead layer *a* has become entirely cold I pour upon it into the same mold A molten tin, which may be also mixed with about one per centum of bismuth, producing thus a layer, *b*, on the top of the layer *a*, as in Fig 1. The two layers will firmly adhere in the mold A, and, when cold, are dumped out of said mold, as in Fig. 2.

I next pour into the same mold A another quantity of molten tin, which may also be mixed with bismuth in manner aforesaid, the second supply of tin being about equal to that used in layer *b*. Before the tin thus finally poured into the mold has had time to congeal I throw into the pan or mold A the block *a b* first formed. The molten tin is thereby partly displaced, and some of it is caused to ascend and to embrace the block *a b* around the edges, but does not unite to the upper tin layer by fusion.

When hard, the new layer C of tin will be directly beneath the lead layer *a*, and from it will project a thin collar or film, *d*, that lines the lead layer *a* around the edges, as in-

Fig. 3 and 4. The lead *a* is thus, in the complete ingot, confined between two thicknesses of tin, *b* and *c*, and also wrapped in tin around the edges, so that in rolling there is no danger that the lead will flow out from between the tin.

I find that the lead is apt to flow out from between the tin, as it yields more readily to the action of the compressing machinery. I mix the lead with bismuth, in manner stated, in order, first, to make it tougher and less liable to flow out from between the tin; and secondly, to improve its gloss and color, in case some of the lead in the foil should become exposed through ruptures in the tin covering.

I mix the tin with bismuth in order to make it more elastic and more capable of flowing in harmony with the lead, and also to improve its color and its gloss. In fact, by mixing both metals with bismuth, they are brought to a nearly equal degree of elasticity, and consequently are rolled out more evenly, and in the complete foil the tin will be less apt to peel off the lead, as it does in the ordinary foil.

I claim as my invention—

1. The method herein described for forming a foil-ingot, the same consisting in pouring molten tin upon congealed lead, and then placing the so-formed block-lead downward in a bath of molten tin, whereby the tin unites to the bottom of the lead, and, rising around the block of lead and tin, embraces the same without uniting thereto by fusion, substantially as described.

2. A foil-ingot, consisting of three layers of metal, one of the outer layers projecting upward around the edges of the ingot, and embracing it, but not united to the other outer layer by fusion, substantially as described.

3. The ingot herein described, consisting of a layer of lead alloyed with bismuth, incased in tin, which latter may or may not be also alloyed with bismuth, substantially as described.

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Witnesses:

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