

(No Model.)

W. B. HOLLINGSHEAD.  
COMPOUND SHEET METAL PLATE.

No. 488,499.

Patented Dec. 20, 1892.

Fig. 1.

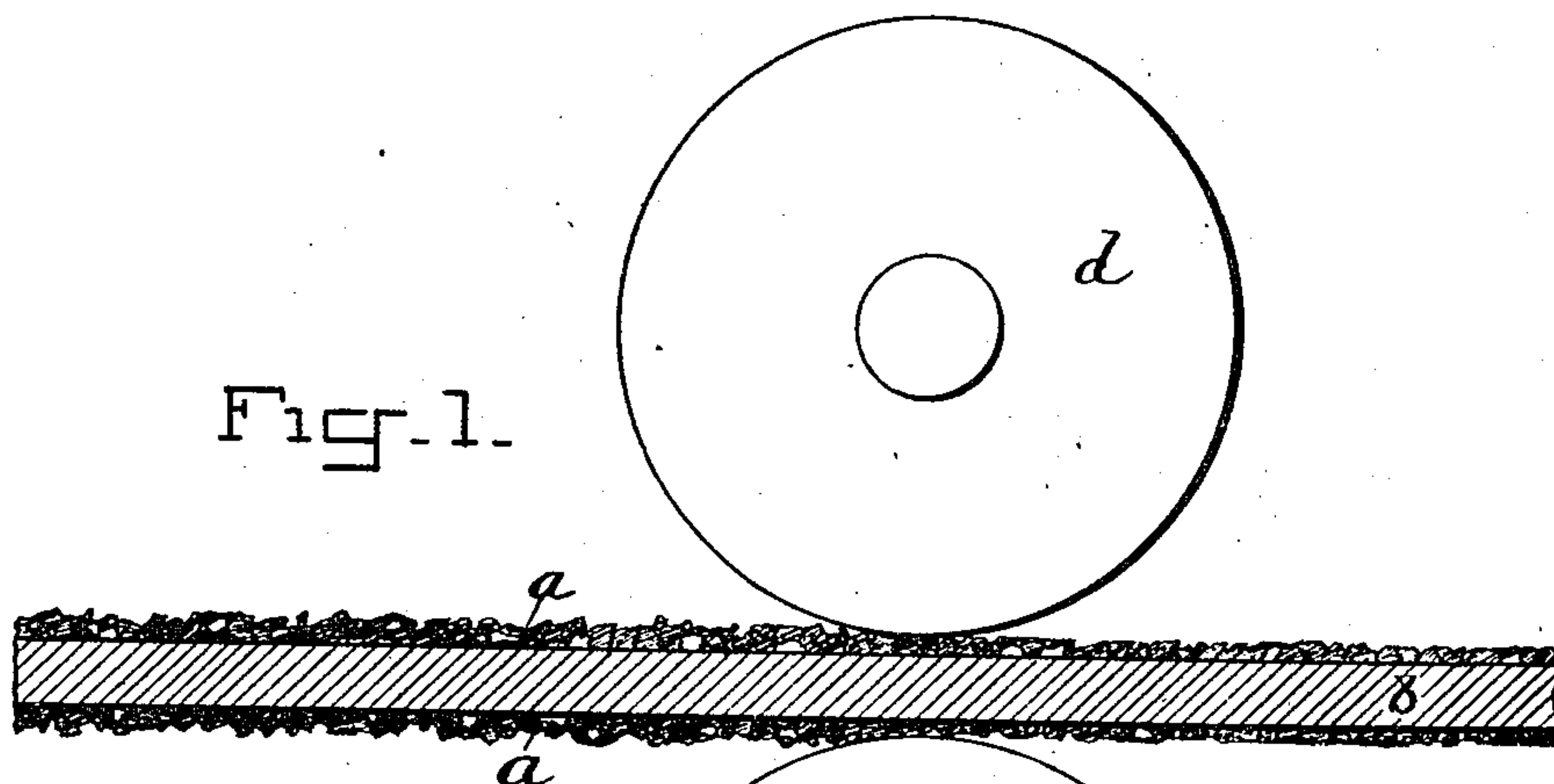
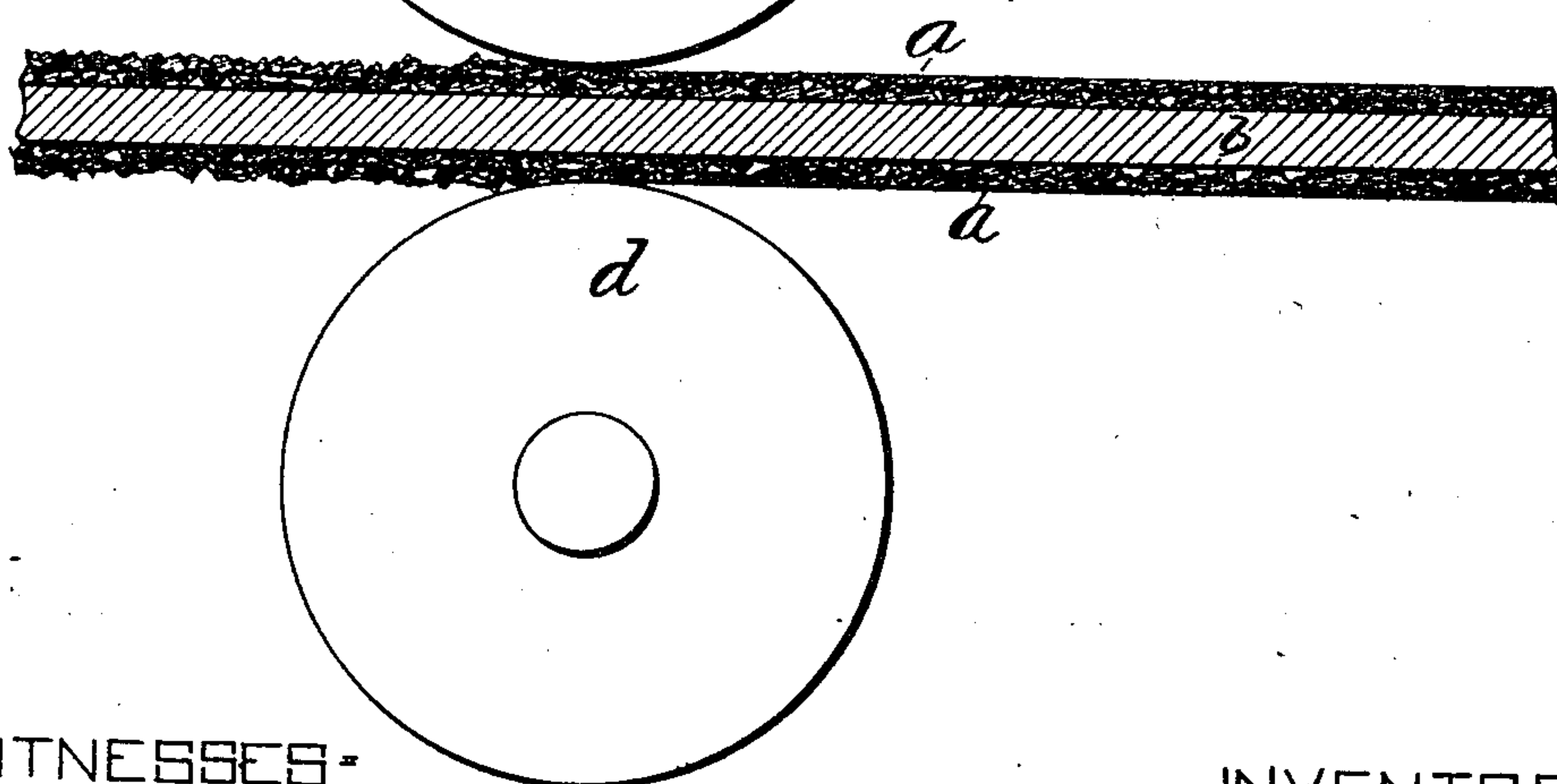


Fig. 2.



WITNESSES-

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# UNITED STATES PATENT OFFICE.

WILLIAM B. HOLLINGSHEAD, OF BRONXVILLE, ASSIGNOR OF ONE-HALF TO  
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## COMPOUND SHEET-METAL PLATE.

SPECIFICATION forming part of Letters Patent No. 488,499, dated December 20, 1892.

Application filed March 2, 1892. Serial No. 423,448. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. HOLLINGSHEAD, a citizen of the United States, and a resident of Bronxville, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Compound Sheet-Metal Plates, of which the following is a specification.

My invention relates to the production of compound sheet metal plates composed of a rolled iron steel or other oxidizable base having its surfaces protected with protective metals or alloys, as copper, zinc, tin and the like but more particularly copper, and it consists in the improved mode of applying such protecting surfaces whereby better and more effective and lasting adhesion of the protective metal is secured, and in the improved article of manufacture comprising such compound plates having the improved surface protecting coatings of my invention, as hereinafter fully described reference being made to the accompanying drawings in which:—

Figure 1 is a side elevation of a pair of rolls and section of a part of a plate between them as in the process of treatment for producing the surfaces of the protective coatings deposited thereon in crystallized form as in the electro-plating bath, and Fig. 2 is a similar view illustrating the repetition of the rolling process after another deposition of a second or third increment of the coating which is necessary to insure the production of the impervious coating without condensing the coating material so deeply by rolling as to disturb the adhesion of the crystals with the surfaces of the plates.

I am aware that it has been attempted to force deposited copper into closer contact with iron in the manufacture of printing rolls by subjecting the deposited coating of copper to considerable pressure by the action of a burnishing roll of hardened steel as set forth in the patent to Wilde No. 193,204, but my experience in the art has demonstrated that any such pressure as affects the deposited crystalline coating to the depth reaching the surface on which the same is deposited has the contrary effect of largely diminishing the adhesion between the two metals, and if continued to a certain degree effects complete

separation, as I have abundantly demonstrated by the use of this very means in the manufacture of copper tubes by depositing the copper on a mandrel and then subjecting the coated mandrel to pressure between rolls sufficient to compress the copper between them and the surface of the mandrel, which besides condensing the copper to the proper consistency also draws it on and separates it from the surface of the mandrel so that the copper is free to be drawn off from the mandrel in the form and condition of a seamless tube.

In my present invention I apply the coating *a*, of ductile metal on the surface of the plate *b*, by the electro-plating process and then proceed to roll, hammer or otherwise reduce the exterior portions of the coatings to smooth surfaces as nearly as possible impervious to moisture without disturbing the inner portions of said coatings adhering to the surfaces of the base plate *b*, which I do by carefully gaging the rolls *d*, or other means of effecting the reduction of the projecting points of the crystals so as to spread and meet together in a continuous uniform surface over the lower or inner portions which are left undisturbed and therefore unaffected as to their power of adhesion to the base plate. I then deposit another increment of the coating material on the previously deposited and rolled coating and subject it to another rolling process as in Fig. 2, the rolls being likewise gaged to prevent disturbance of the contact of the crystals of the previously deposited coating with the plate and thus secure plates fully protected for practical use for roofing and other like uses. The crystals will be finer or coarser according to varying conditions of the kinds and qualities of coating material used, and of the baths in which the application is effected. Where several layers are applied they may be graduated in finer crystals and smaller quantities successively.

I am aware that in Crooke's patent No. 98,354 a process is described of producing ordinary plated surfaces upon rough metals by dipping them in a bath of tin, passing the plates between polished rolls to give an even surface, then manufacturing the desired articles from the tinned plates, then burnishing



the parts made rough in the manufacturing process, and then electroplating the finished articles to produce an ordinary plated external surface which may be burnished or not, and I make no claim for such process, the product of which, though suited for the purposes set forth in the patent, which contemplates articles for use in places protected from out door exposure, would be of little use for my purpose which is more particularly to provide roofing plates. It is well known that tinned plates are not lasting for such use except when carefully protected with paint.

It is not feasible to increase the protective quality of tinned coatings by successive dip-pings of the plates in the bath of molten metal, because the previously deposited coating melts to such extent when again immersed that the quantity adhering remains about the same. An electro deposited coating on a tinned surface as in Crooke's process would not be adapted for my purpose because the soft surface holding the deposited crystals would yield under such pressure of the rolls as is necessary in my process to close the cells of the exterior portion of the crystalline coating and would thus defeat the purpose of the rolling.

I am also aware that rough metal plates have been pickled, tinned, polished, manufactured into special articles and then electro-plated, as in the manufacture of hinges according to the process described in the patent to Crooke No. 98,354, which is essentially different from my process and is not adapted for the practical manufacture of the kind of plates which it is the purpose of my invention to produce, and I make no claim for such process.

I am also aware of the process described in the patent to O'Neill No. 179,462 for electro plating and buffing copper or brass plates

with nickel for the manufacture of culinary vessels, and I do not claim such process.

I claim:—

1. The process of coating or plating oxidizable sheet metal plates with ductile protective metals or alloys, which consists in applying a layer of the coating material adhesively on the surfaces of the plates in crystalline form by electro-deposition, and producing surfaces of the coating material impervious to atmospheric effects by rolling, hammering or planishing the said layer to a limited extent, and thus condensing smoothing and uniting an exterior portion of less thickness than the depth of the deposited material, and, without disturbance of the portions of the crystals in adhering contact with the plates, then depositing a second layer of the said material in like manner and again rolling, hammering or planishing the same also to a limited extent, for the protection of the said crystals adhering to the plates, these two layers so applied constituting a homogeneous skin for the protected material, the inner portion adhering to the plates being in the natural crystalline condition of deposition substantially as described.

2. The improved article of manufacture consisting of an oxidizable metal plate coated with protective metals or alloys having wrought surfaces impervious to atmospheric effects and also having the natural or undisturbed crystalline inner form as deposited on and adhering to the surfaces of the metal plate substantially as described.

Signed at New York, in the county and State of New York, this 2d day of February, A. D. 1892.

WILLIAM B. HOLLINGSHEAD.

Witnesses:

W. J. MORGAN,  
CLINTON E. WHITNEY.