

(No Model.)

H. L. PALMER.
Heat Conducting Vessel.

No. 243,459.

Patented June 28, 1881.

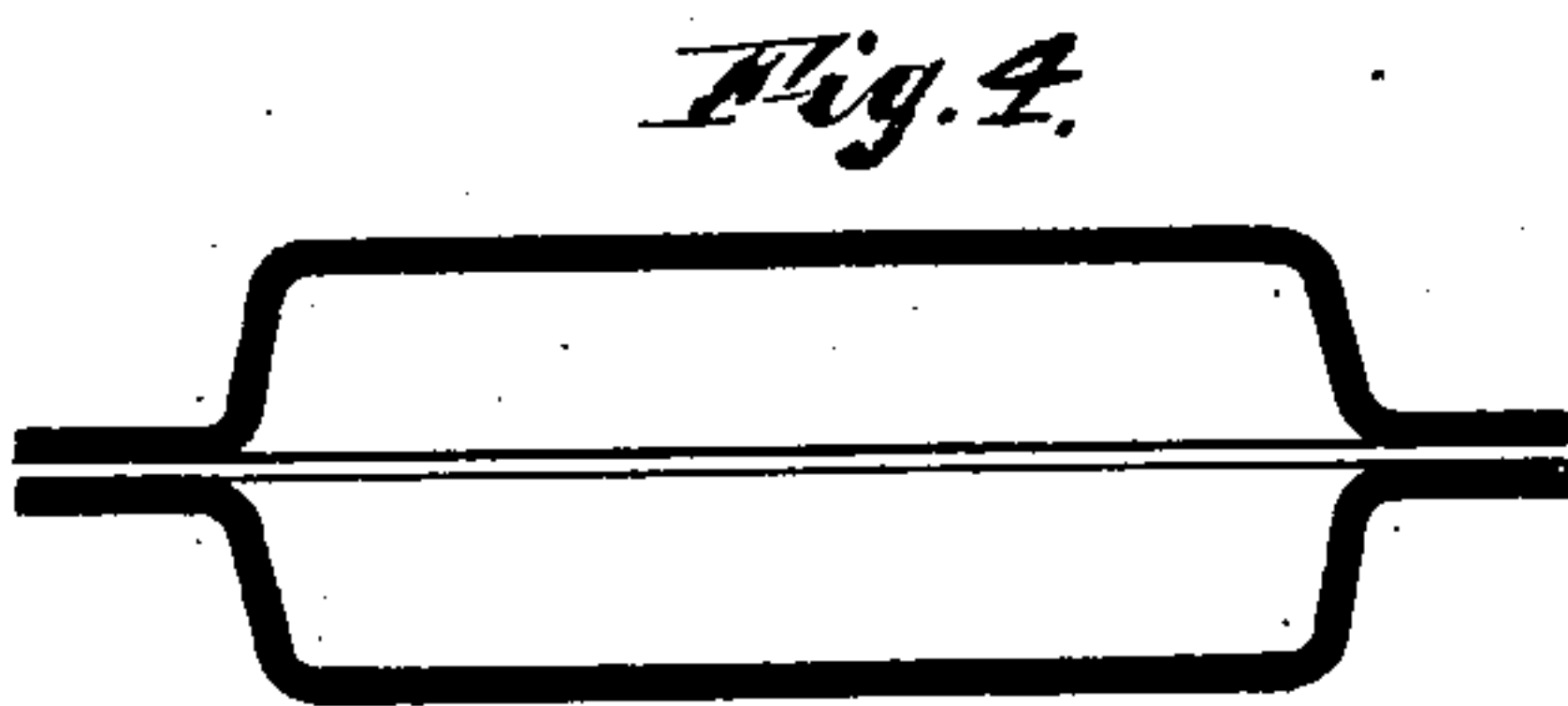
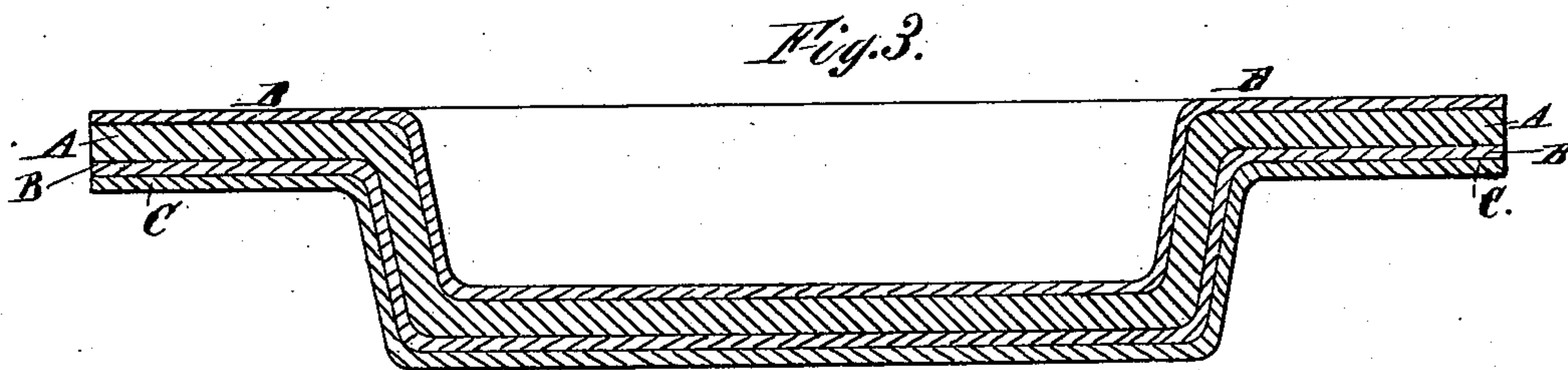
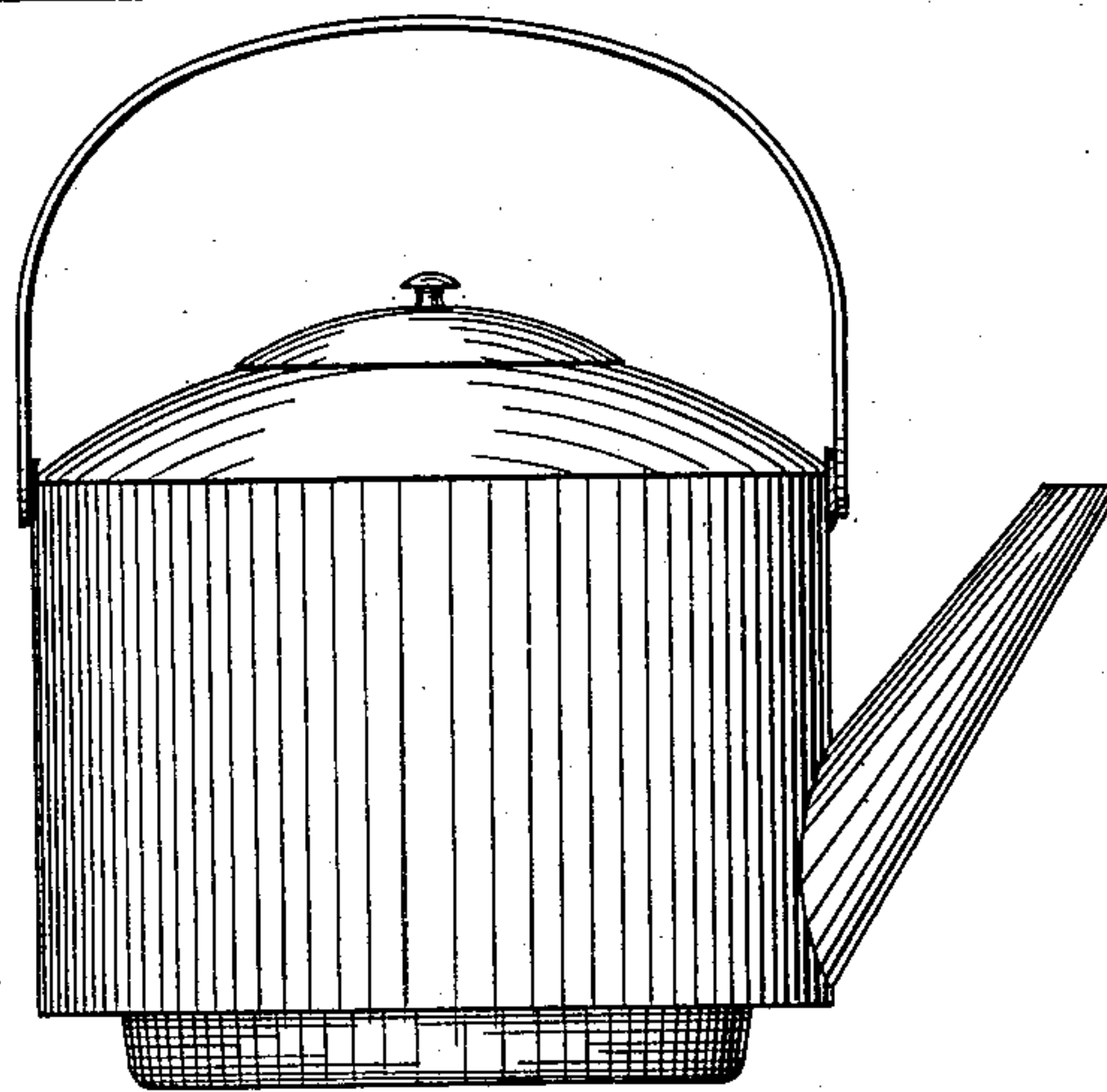


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY L. PALMER, OF BROOKLYN, NEW YORK.

HEAT-CONDUCTING VESSEL.

SPECIFICATION forming part of Letters Patent No. 243,459, dated June 28, 1881.

Application filed May 3, 1880. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. PALMER, of Brooklyn, in the county of Kings and State of New York, have made certain new and useful
5 Improvements in the Manufacture of Heat-Conducting Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, the
10 same not having been, to my knowledge, heretofore patented in any foreign country.

The object of my invention is to prepare iron or any equivalent cheap material in such a way that when used in heat-conducting or
15 other vessels, utensils, or structures it shall be rendered a better conductor or conveyer of heat, less liable to corrode or be affected by acids than heretofore, easy to clean, and not so liable to the deposition of soot as in previous
20 constructions, and, while affording for some uses all the advantages of a metal of uniform composition throughout, it will be very much less expensive to manufacture.

To accomplish all of this the invention consists, essentially, in coating one or both sides
25 of a certain base—iron, for instance—with tin, and afterward coating or plating the tinned base with copper on one side, and in certain details, all of which will be hereinafter first
30 fully described, and then pointed out in the claims.

In the drawings, Figure 1 represents a section of a metallic base prepared in accordance with my invention, the different layers of material (enlarged) being plainly indicated by the
35 sectional lines, and the figure representing only one side of the base as being prepared in accordance with my invention. Fig. 2 is a similar view, in which both sides of the base
40 are shown as coated, the upper with tin and the lower side with tin over which there is a layer of copper. Fig. 3 is an enlarged section of a tea-kettle bottom, or the bottom of an ordinary cooking utensil, prepared for use in accordance with my invention. Fig. 4 is a sectional view, representing the position of two
45 kettle-bottoms ready for the copper coating, to be applied only upon one side of each. Fig. 5 is an elevation of a complete kettle which it
50 may be desired to treat in accordance with my invention.

Like letters of reference, wherever they oc-

cur, indicate corresponding parts in all the figures.

The invention may best be explained by reference to its application to a kettle or kettle-bottom, and for that reason such devices are shown to the exclusion of others, except the plain metallic plates shown in Figs. 1 and 2. 55

Taking the base A of the kettle-bottom, 60 which is preferably of iron or iron plate, I first coat it by any of the known processes with tin, as indicated at B B. Then, if it be desired to add the coating of copper, it may afterward be submerged in a plating-solution 65 of salts of copper, and the deposit formed thereon in the usual way of copper-plating on one side; or any other means of applying the plating may be employed which is equivalent to the electroplating process—that is, which 70 affords an intimate and perfect metallic union throughout the extent of surface. It is not intended to apply a simple sheet of tin to the base and upon such tin sheet a separate sheet of copper, for such application of separable 75 sheets would not answer the purpose of my invention, as will hereinafter appear.

When desired that the copper coating be applied upon only one side of the kettle-bottoms, two of them, after having been tinned 80 on both sides, are placed together, as indicated at Fig. 4, their sides or edges being united, and both are then submerged or otherwise coated. After being separated it will be found that the outer surfaces alone are coated. 85

By similar expedients other articles may be likewise treated—as, for instance, the kettle shown in Fig. 4 may, with its top in place, be completely submerged and the exterior only receive the coating of copper. In this case, if 90 the kettle or other vessel be made up of separate pieces soldered or otherwise joined, the plating will fill up all the joints or cracks, and thus render the whole more secure against leakage. 95

With respect to the kettle and the kettle-bottoms, it is well known that a copper bottom is preferred to any other because of its superior heat-conducting properties and peculiar adaptability for the particular situation 100 and use; but a copper bottom or copper kettle is expensive and is more liable to become injuriously affected by acids, &c., and to communicate injurious qualities to matters placed

therein, a very serious drawback to the use of the solid copper. If the solid copper be plated with tin on the interior, as long as the tin-plating lasts the disadvantage of the copper in point of communicating poison to the water, &c., is removed, but the process only adds to the expense of manufacture, and the tin easily wears away, leaving the copper exposed. In my improved form if the tin wears away it leaves only an iron surface, which is not at all injurious.

It is found that the copper-plating will permit the ready communication of heat to the iron, and the tin surface or interior conveys this heat to the liquid in the vessel much more rapidly than if the interior tinning be omitted. It is therefore preferred, for such uses, to always employ the tin interior coating. The copper-plating is easier to apply upon the tinned surface than upon iron alone, and for that reason the iron is first coated with tin.

For all purposes of the kettle or kettle-bottom, and for many other structures not necessary to name, the ordinary commercial tin affords the base already provided with its tin covering, and from this the articles are first made and afterward coated with copper. In this manner a kettle or kettle bottom or top may be produced which will cost little more than the ordinary tin device and present all the advantages of the solid copper, with some not discoverable therein. The ordinary commercial tin is difficult to spin and stamp into shape or otherwise work or draw. The addition of the copper coating is found to greatly relieve this difficulty, rendering the coated sheet easy to spin or stamp and otherwise manipulate, and whether or not the device formed be intended for conveying heat the invention is especially advantageous in this respect.

In accordance with my invention I take a sheet of iron, A, Fig. 1, coat it first with tin, as at B, and upon the tin place a coating of copper, as before explained; or, as indicated in Fig. 2, I coat the base A on both sides with tin B and afterward on one side with copper C. The last of these forms will be found to work best, but either will be found to possess greater pliability than the iron alone, or the iron with only tin applied.

The commercial tin affords an excellent base for the constructions indicated in Fig. 2, being already in the form of a sheet of iron with tinned surfaces. The base may be as thick or as thin as circumstances require.

From these illustrations and explanations it will appear that the invention is applicable to a great variety of uses, particularly in all

devices spun or stamped or otherwise formed or drawn up into shape, to all heat-conducting surfaces, to heaters, stove-pipe rings, cooking-vessels, illuminators, and various ornamental and useful articles not necessary or possible to enumerate.

I propose to furnish the metal base prepared in accordance with my improvements and ready for use, as explained; and I also propose to apply the improvement upon articles already formed or made in a partial state of completion.

The mere appliance of the copper coating upon the tin coating may be variously modified—as, for instance, by increasing or decreasing the amount of deposit, or by addition to the plating-solution of zinc sulphates, &c., giving the plating a color or shade more resembling brass, in accordance with principles already known to the platers; or several separate and distinct layers may be deposited of different metals, and by cutting through one or more layers those underneath will be exposed, thus producing a surface of variegated appearance.

The cutting or removing of portions of the different layers may be accomplished by use of ordinary implements, such as the gnarling-tool or graver, &c.

Having now fully described my invention, I desire to add that I make no claim to the copper plating or coating *per se*, nor to the copper-plating upon a base of iron merely, nor to the mere plating of copper upon a surface of tin, as I am well aware that such features are not patentable. A covering of zinc might be used instead of the tin.

What I claim as new herein, and desire to secure by Letters Patent, is—

1. In combination with the base of commercial tin A, an electro or equivalent plating of copper upon one side of said tin base, leaving the opposite side with its tinned surface exposed, as and for the purposes herein set forth.

2. As a new article of manufacture, the herein-described metallic bottom for utensils, the same being composed of a base of commercial tin having a plating of copper upon the under side thereof, leaving the opposite side with its tinned surface exposed, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

HENRY L. PALMER.

Witnesses:

WORTH OSGOOD,
ARTHUR M. PIERCE.