

(No Model.)

E. NORTON.

SHEET METAL PLATE FOR TINNING AND THE ART OF ITS MANUFACTURE

No. 488,151.

Patented Dec. 13, 1892.

Fig. 1.

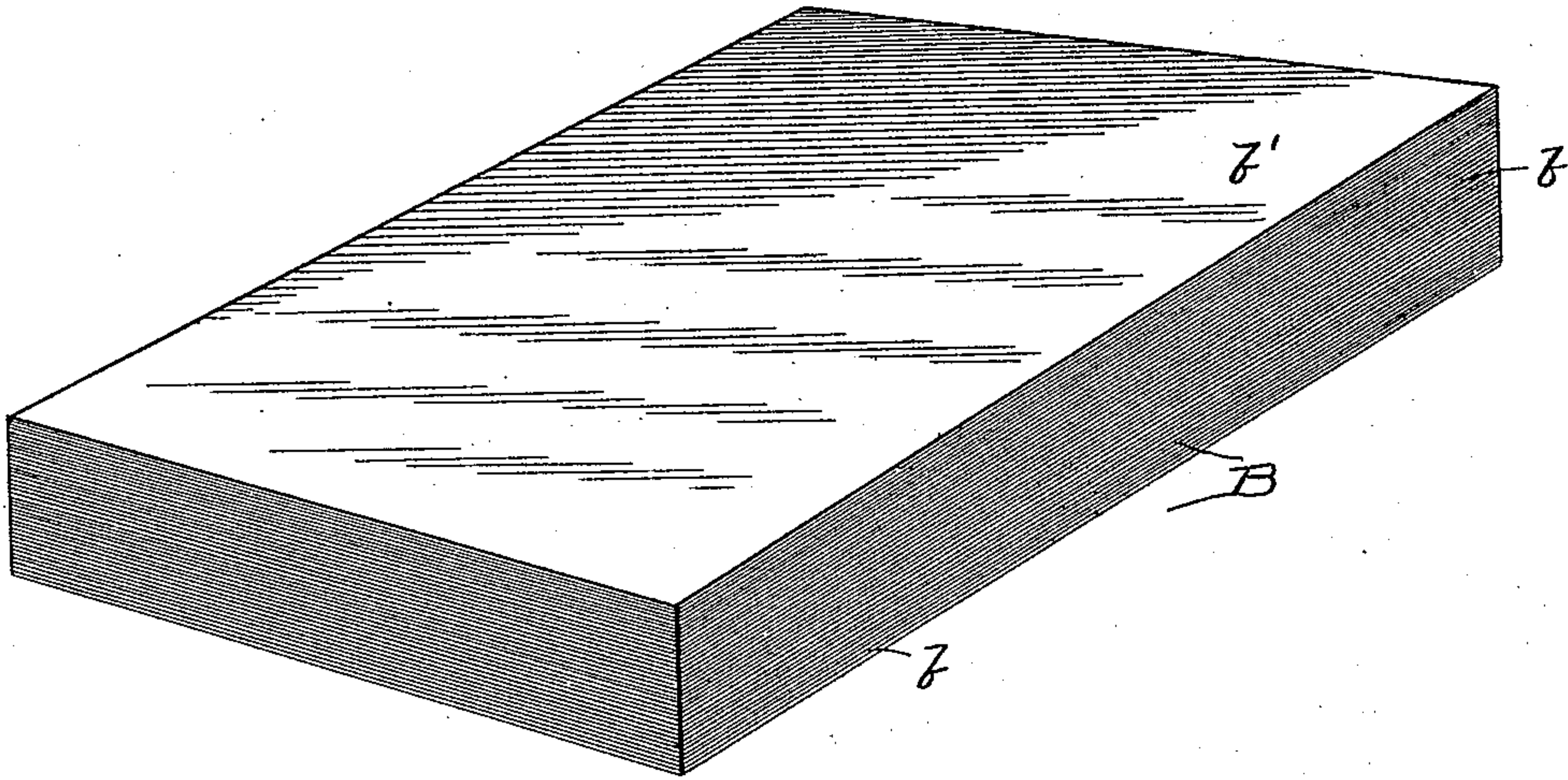


Fig. 2.

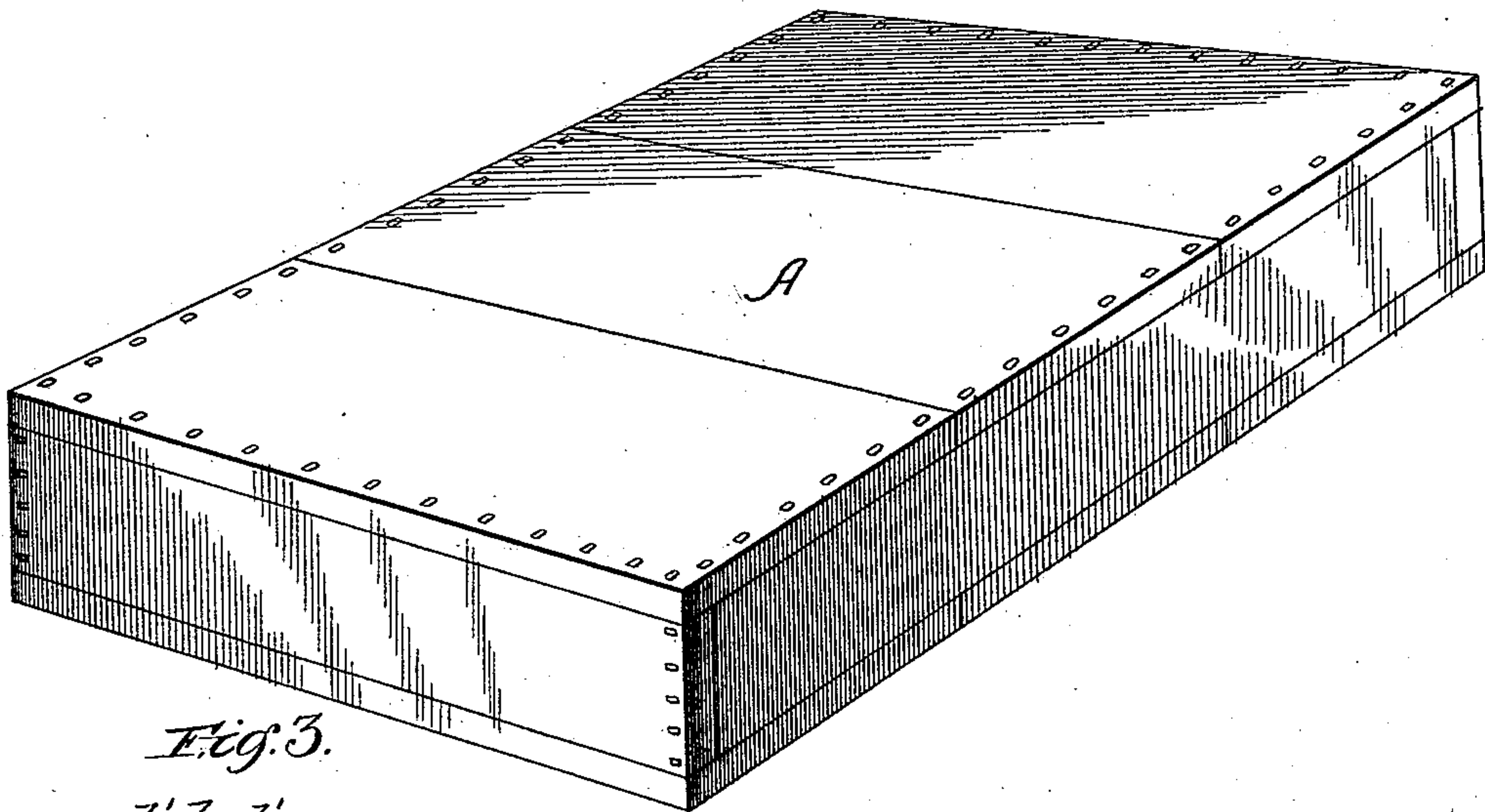
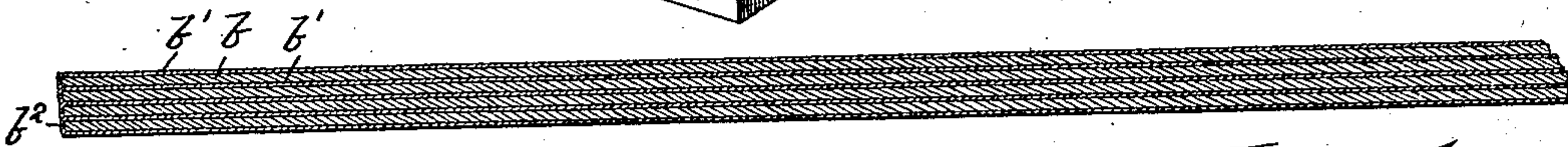


Fig. 3.



Witnesses:
S. M. Rheem.
A. M. Munday,

Inventor:
Edwin Norton
By
Munday, Hart & Holcomb his Atty's.

UNITED STATES PATENT OFFICE.

EDWIN NORTON, OF MAYWOOD, ASSIGNOR TO HIMSELF, AND OLIVER W. NORTON, OF CHICAGO, ILLINOIS.

SHEET-METAL PLATE FOR TINNING AND THE ART OF ITS MANUFACTURE.

SPECIFICATION forming part of Letters Patent No. 488,151, dated December 13, 1892.

Application filed June 13, 1892. Serial No. 436,432. (No model.)

To all whom it may concern:

Be it known that I, EDWIN NORTON, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Sheet-Metal Plates for Tinning and in the Art of their Manufacture, of which the following is a specification.

My invention relates to improvements in shipping packages of sheet-metal plates such as are commonly employed in the manufacture of tin or terne plates.

Heretofore it has been customary to ship thin plates or sheets of iron or steel from the place where they are rolled to the place where they are tinned or coated with tin or other metal in the condition that these plates come from the rolling-mill, the same being commonly termed "black plates," and very great difficulty and loss are experienced owing to the fact that these black plates will continue to rust or oxidize while they are being stored or shipped or during the period that elapses between the rolling of the plates and the tinning or coating of the same with metal. It often happens that many of the plates are found to be eaten entirely through in spots by the rust when they are subjected to the pickling-bath to remove the scale and rust preparatory to tinning the plates, and though the plates are not eaten entirely through by the rust they are frequently so thinned in spots as to render them practically worthless. This also renders it necessary to employ skilled inspectors to detect the defective sheets.

The object of my invention is to overcome this difficulty and provide a means whereby the thin plates of iron or steel after being rolled to the required gage may be kept stored any desired length of time or shipped without loss or injury from rust or oxidation and without in any way adding to or requiring any additional labor or steps in the complete process of manufacturing the tin or terne plates. In other words, it is the primary design of my invention to accomplish this important result and to secure it without any additional cost of labor or material.

To this end my invention consists in taking

the black plates after they have been rolled or finished at the mill and first subjecting them to the ordinary pickling-bath commonly used as the preparatory step to tinning the sheets, whereby the scale or oxidation is removed from their surface. The white sheets thus produced are then washed or bathed in water to remove all traces of the acid, and then the white and cleaned sheets are dried and fluxed, the drying and fluxing operations being preferably performed simultaneously, so that the bright or white surface of the sheet is at all times protected by the film of water or by the film of oil flux applied thereto as the water is driven off in the drying operation. The white sheets after being thus dried and fluxed with oil—palm-oil being preferably used as the flux—are then piled evenly one on top of another in suitable boxes or packages for shipping. As the bright flat smooth sheets are laid one on top of another in the package, they are pressed snugly together by their own weight, and the oil or flux is to some extent pressed out between the sheets and made to exude and flow down over their edges in the package. The package of sheets is then allowed to cool, which hardens or stiffens the palm-oil, thus causing the individual sheets to stick or adhere together with considerable firmness in one solid package or block. The adherence of the sheets together is also greatly aided by the atmospheric pressure, as the smooth flat sheets, coated with oil on both sides, when laid on top of one another and under the weight of the package, effectually drives out the air between the sheets. The package of fluxed white adhering sheets may then be boxed, if not previously placed in the box, and are ready for shipment or storage for any length of time. The package of white adhering oil-fluxed sheets may then safely be shipped upon ocean voyages requiring many months without any danger of the least injury or loss from rust or oxidation, and when it is desired to coat the sheets with tin, lead, or other metal in the manufacture of tin or terne plates the sheets are already fluxed and ready for immersion in the tinning-pot. To separate the sheets, however, from each other preparatory

to putting them separately into the tinning-pot, the package of sheets is first theated, thus again softening the oil flux and enabling the sheets to be separated with comparative ease. The heating of the sheets is also, of course, an incident preparatory to subjecting them to the tinning-bath in order to cause them to properly take the tin.

In practicing the invention any well-known method or means for pickling the black sheets and producing white, bright, or pickled sheets now known to or commonly employed by those skilled in the art in tin-plate factories may be used, and the same may be said as to the method or means employed for drying and fluxing the wet sheets after they come from the pickling or washing and cleaning bath. The method and process, however, which I prefer to use for drying and fluxing the wet pickled sheets are that shown and described in my pending application, Serial No. 412,073, filed November 16, 1891, and in the pending application, Serial No. 427,983, filed April 6, 1892, of myself and John G. Hodgson.

By employing as the film or coating for protecting the surface of the white sheets from oxidation and for causing the same to adhere together a substance which also at the same time serves as a flux for the metal tinning or coating operation it will be observed that I accomplish the important new result before pointed out without increasing in any way the labor, material, or expense of the manufacture of the final tin or terne plates.

It will readily be understood by those skilled in the art that if the black plates were furnished with a coating to prevent further oxidation before the plates were pickled the material used for this preservative coating would be lost or wasted and that also great labor and expense would be involved in removing such preservative coating preparatory to the subsequent pickling operation, to say nothing of the labor and expense incident to coating the sheets with such preservative material, and that also if the sheets after being pickled were coated with a preservative substance that would not also serve as a flux in the subsequent tinning operation much the same difficulties would be experienced; but, according to my invention, where the white pickled sheets are coated with a preservative substance which serves also as a flux in the subsequent tinning operation, I accomplish the beneficial result in view and effect the saving without any unnecessary steps or operations tending to add to the cost of the first manufacture or the tin or terne plates.

In the accompanying drawings, which form a part of this specification, I have shown at Figure 1 a package or box of white or pickled fluxed and adhering plates of iron or steel embodying and prepared according to my invention, the same being sheets such as are commonly used in the manufacture of terne or tin plates. Fig. 2 is a similar view show-

ing the package boxed for shipment. Fig. 3 is an enlarged cross-sectional view showing a few only of the sheets and in which their thickness is exaggerated, so that the sheets and their surface coatings or films of flux or palm-oil may be also indicated.

In the drawings, A represents the box or inclosing-case; B, the package of adhering fluxed white plates of iron or steel; *b*, one of the individual sheets, and *b'* the film or coating of palm-oil or other flux, which will also act as a preservative from oxidation or rust, and by which the sheets are caused to adhere together more or less firmly and in connection with the bright smooth surface of the sheets to expel the air from between the sheets. The film or coating of palm-oil *b'*, which collects at the edges of the package B, is of course thicker than the film *b'* between the sheets, owing to the somewhat rough and uneven edge of the package B as a whole, such edge of the package being of course composed of the individual edges of the sheets *b*.

In practice I have found by experiment where palm-oil is used as the flux and preservative substance that after the oil and package of sheets become cold the individual sheets will adhere so firmly together that the whole package may be conveniently picked up and handled without danger of displacing or separating the sheets one from another. The package of sheets when thus prepared constitute, in fact, a solid block, the sheets, in fact, hermetically sealing and protecting each other.

I desire it to be understood that while the substance I prefer to use for coating the sheets after they are pickled and dried is palm-oil, as this substance serves well the double function of a flux in the subsequent tinning operation and also as a preservative against oxidation of the sheets during shipment or storage, my invention is not limited to the use of this particular substance; but other substances which will perform this double function may be used as equivalents of or substitutes for the palm-oil coating, which for convenience is specifically mentioned in the claims.

I claim—

1. As a new article of manufacture, the shipping or storage package of iron or steel sheets for tinning hereinbefore described and consisting of a number of white or pickled sheets of iron or steel coated with palm-oil, the same serving the double function of a preservative against oxidation during storage or shipment and of a flux in the subsequent tinning operation, so that the sheets after being stored or shipped may be tinned without further pickling or fluxing, the individual sheets being placed or piled close together and having the air expelled from between the same, substantially as specified.

2. The process of preparing tinning sheets of iron or steel for shipment or storage and

subsequent tinning, consisting in first pickling and cleaning the black sheets, then drying, heating, and fluxing the white or pickled sheets with a flux which will also serve as a preservative against oxidation, and then piling or placing a large number of the white dried and fluxed sheets closely together in a package suitable for shipment or storage and allowing the sheets and their flux coating to cool, and thus cause the sheets to adhere together in the package, so that the sheets after being shipped or stored may be subsequently tinned without further pickling or cleaning and the preservative coating utilized as the flux in the tinning operation, substantially as specified.

3. The process of preparing tinning sheets of iron or steel for shipment or storage, consisting in first pickling the black sheets, then fluxing the white or pickled sheets with a flux which will also serve as a preventive from rust or oxidation, and then placing the white and fluxed sheets together in a shipping box or package, substantially as specified.

4. As a new article of manufacture, sheets of iron or steel prepared for tinning and consisting of white or pickled sheets of iron or steel coated with palm-oil, the same serving the double function of a preservative against oxidation during storage or shipping and of a flux in the subsequent tinning operation, so that the sheets after being stored or shipped may be tinned without further pickling or fluxing, substantially as specified.

5. The shipping or storage package B of smooth white or pickled palm-oil coated sheets of iron or steel, the individual sheets adhering together by the palm-oil coating between the same and by the atmospheric pressure on the outside of the package, the air being expelled from between the individual sheets, in combination with an inclosing box A, substantially as specified.

EDWIN NORTON.

Witnesses:

H. M. MUNDAY,
EMMA HACK.