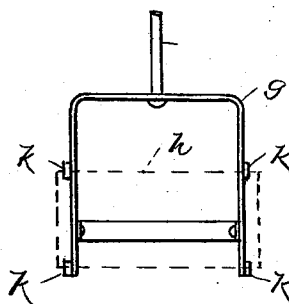
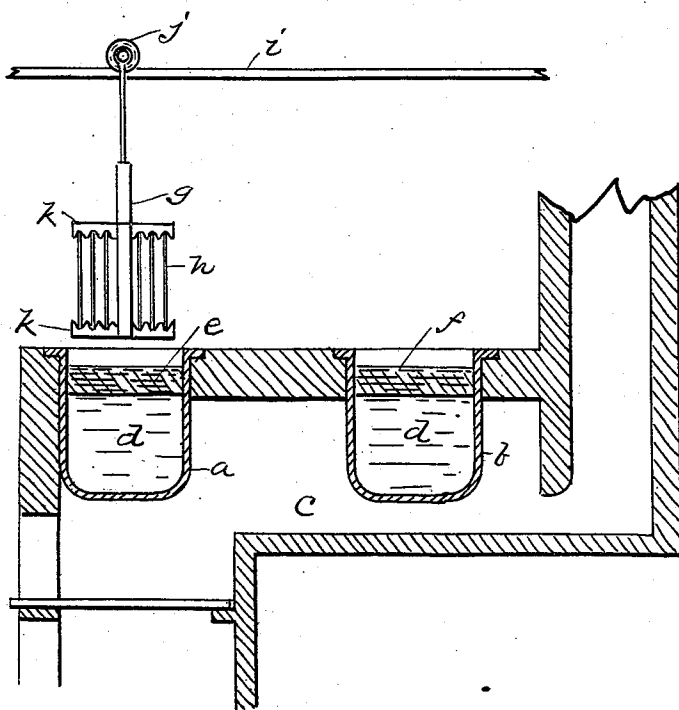


(No Model.)

W. H. GRIFFITHS.
PROCESS OF MANUFACTURING TIN PLATE.

No. 532,660.

Patented Jan. 15, 1895.



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM H. GRIFFITHS, OF PITTSBURG, PENNSYLVANIA.

PROCESS OF MANUFACTURING TIN-PLATE.

SPECIFICATION forming part of Letters Patent No. 532,660, dated January 15, 1895.

Application filed March 14, 1894. Serial No. 503,567. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM H. GRIFFITHS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Processes of Manufacturing Tin-Plate; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved process for manufacturing tin plate, terne, or lead plates, and consists in dipping the plates successively in two kettles each containing a quantity of pure tin, or a mixture of lead and tin, reduced to a molten condition, and having in the first or coating kettle a covering of sand mixed with palm oil and a chemical flux to facilitate the finish of the plates, and in the second or finishing kettle a covering of sand mixed with palm, linseed oil or tallow, thereby reducing the labor, together with an improved apparatus for dipping several sheets at one and the same time, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a side sectional elevation of a furnace provided with kettles and dipping apparatus for the manufacture of tin or terne plates in accordance with my invention. Fig. 2 is a front elevation of the device for holding the sheets while being operated on.

In order to manufacture tin plate in accordance with my improved process, I provide two kettles *a—b* and arrange the same in a furnace *c* of suitable construction whereby the metal may be reduced to a molten condition. Placed on the top of the metal *d*, in the first kettle is a quantity of clean sand *e*, mixed with a suitable oil such as palm or linseed and also with a chemical flux—consisting of about one third salammoniac and two thirds of nitrate of zinc. The other or second kettle *b*, contains a quantity of tin having a covering of sand *f*, mixed with palm or linseed oil or tallow.

The plates to be coated or covered are first cleaned and treated in a manner well known

in the art, and then forced down through the sand *e* of the first kettle *a* into the metal *d*, and then withdrawn. The plates *h* passing upward through the sand *e*, clean or scour themselves leaving the surplus metal in the sand *e*, which being oiled will not retain the same, but permit the minute particles of tin to return to the main body below. This operation is repeated several times until a proper coating is given the plates as the action of the sand will serve to clean the plates and give an even and the desired thickness.

To finish the plates the same are immersed in the metal *d* of the second kettle *b*, and withdrawn through the sand in the same manner as before described, which regulates the thickness of the coating and makes a smooth surface. The sand *f* acting as a brush dispenses with what is known in the art as "brushmen."

By mixing the sand with an oil or other fatty substance, the same will prevent the minute particles of tin or other metals from adhering to the sand, and thereby rendering the same useless for the purpose of brushing or scouring and removing the surplus and uneven portions of the coating. By the use of this mixture of sand and oil on the top of the metal much time and labor is saved, as in the process now in use the operator is compelled to brush the plate after each immersion with a bundle of hemp or tow.

To facilitate the dipping of the sheets I provide a cage consisting of a bent bar *g* to which rack bars *k* are attached capable of holding a number of plates *h*, which may be either sprung into position or run in at the end. This cage may be attached to an overhead railway *i* provided with a trolley *j*, which will admit of the said cage being lowered to dip the said plates or elevated to withdraw the same out through the sand.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The herein described process of manufacturing tin plates, terne, and the like which consists in first dipping the plates into a bath of molten metal through a layer of sand mixed with oil and a chemical flux consisting of salammoniac and nitrate of zinc, which layer

floats on the surface of the molten metal, and
withdrawing the plates; and a second dipping
of the plates into another bath of molten
metal through a layer of sand mixed with oil
5 or tallow floating on said metal, and with-
drawing the plates through the layer, as set
forth.

In testimony that I claim the foregoing I
hereunto affix my signature this 27th day of
November, A. D. 1893.

WILLIAM H. GRIFFITHS. [L. S.]

In presence of—

P. B. REILLY,

M. E. HARRISON.