

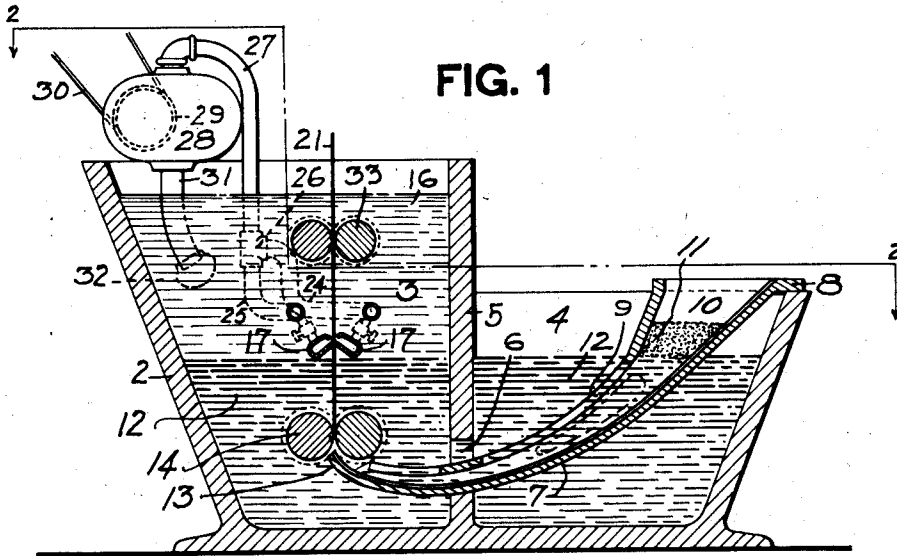
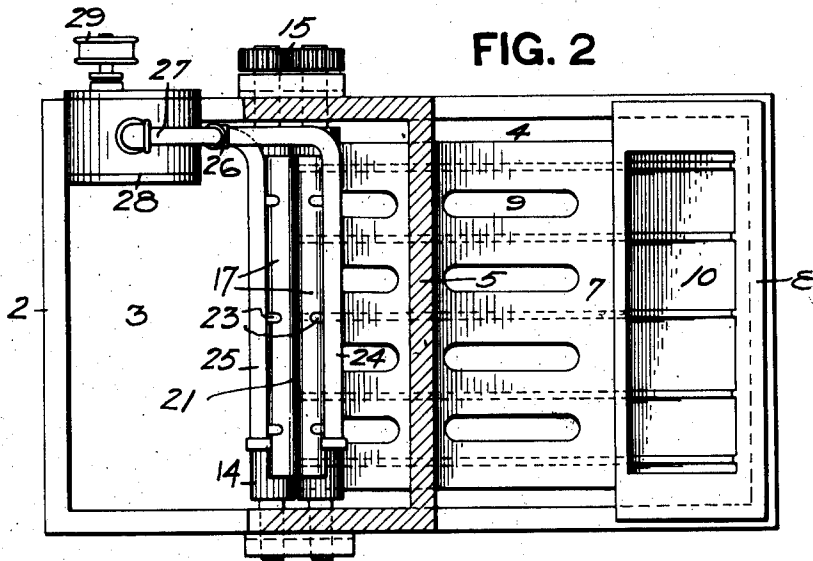
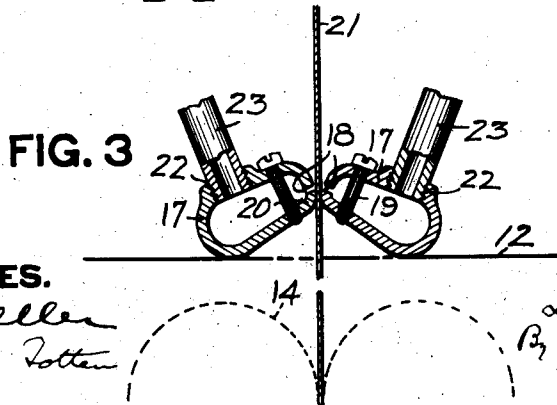
No. 854,006.

PATENTED MAY 21, 1907.

L. C. STEELE.

PROCESS OF TINNING OR COATING METAL SHEETS.

APPLICATION FILED SEPT. 24, 1906.



WITNESSES.

J. R. Keller  
Robert C. Zotten

INVENTOR.

Lawrence C. Steele  
By Kay Zotten & Winter  
attorneys

# UNITED STATES PATENT OFFICE

LAWRENCE C. STEELE, OF PITTSBURG, PENNSYLVANIA

## PROCESS OF TINNING OR COATING METAL SHEETS.

No. 854,006.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed September 24, 1906. Serial No. 335,954.

*To all whom it may concern:*

Be it known that I, LAWRENCE C. STEELE, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Processes of Tinning or Coating Metal Sheets; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to tinning or coating with other metals, its object being to provide a simple and efficient process of removing the surplus metal from the sheet after it has passed through the coating metal, thereby greatly reducing the waste metal and giving a more uniform coating to the plate.

To these ends my invention comprises, generally stated, the process of tinning or coating with other metals consisting in passing the sheet to be coated through molten coating metal and through the oil thereon, and applying suction at a point adjacent to the sheet and extending across the same while said sheet is passing through the oil. The oil being drawn rapidly across the face of the sheet draws off the surplus tin with it.

In the accompanying drawing, I have illustrated a suitable apparatus for carrying out my process in which

Figure 1 is a vertical section of a suitable tinning pot; Fig. 2 is a section on the line 2—2, Fig. 1. Fig. 3 is an enlarged detailed sectional view of the suction apparatus.

I will first describe the apparatus illustrated for carrying out my invention and then describe the process as carried out by such apparatus.

The numeral 2 designates a suitable tinning pot divided into compartments 3 and 4, separated by the wall 5. The opening 6 in said wall 5 brings the compartments 3 and 4 into communication with each other. Located within the compartment 4 and projecting through the opening 6 into the compartment 3 is the guide or apron 7 which may be formed of a single casting with the flange 8 resting upon the outer wall of the pot and supported at its inner end by the lower portion of the partition 6 which separates the compartments 3 and 4. The front of the apron 7 is provided with the openings 9 by means of which the metal is permitted to enter the apron. At the upper end of the apron 7 is what is termed the flux box 10, which contains suitable flux 11 which floats upon the tin 12 contained in the pot. The forward end 13 of the apron 7 projects slightly beyond

the main portion of said apron and acts to guide the plate up through the rolls 14, which are located within the compartment 3 of the pot. These rolls may be driven by suitable gears 15 connected up to the source of power.

The tin 12 within the pot rises to the same level in both compartments and above the tin in compartment 3 and resting thereon is the body of oil, or other suitable material, 16, usually palm oil.

Located within the compartment 3 and submerged in the oil above the tin-line are the suction nozzles 17 having the openings 18 extending for practically their entire length. These nozzles 17 may be formed of cast metal and in order to provide for the varying size of the openings 18, bolts 19 pass through the nozzles and by tightening or loosening said bolts the metal may be compressed or released slightly so as to increase or diminish the size of the openings 18. The lower lip 20 of the nozzle 17 projects slightly beyond the upper lip and the lower lips of the nozzles are in such position with reference to each other that when the plate 21 passes between said nozzles, the said lower lips will be in very close proximity to the opposite faces of said plate, or in fact, may contact slightly there- with if desired.

Connected to suitable threaded openings 22 in the nozzles 17 are the pipes 23 which are connected to the main pipes 24 and 25. These main pipes are connected by the T connection 26 to the single pipe 27 connected up to the pump 28. This pump 28 may be of any suitable construction for creating suction through the nozzle 17 and as I make no claim as to the particular construction of the pump I do not deem it necessary to illustrate same in detail. This pump 28 may be driven by the pulley 29 connected up by the belt 30 to a suitable motor or engine. Connected to the exhaust of the pump is the pipe 31; which projects down into the compartment 3 of the pot and secured to the outer end of said pipe is the strainer 32 of suitable construction.

Above the nozzles 17 is a second pair of rolls 33 which act to guide the plate up out of the pot in the ordinary manner.

In carrying out my invention with the above described apparatus, the plate 21 to be coated, is introduced into the flux box 10 and passing through the flux enters the tin bath and is forced down through the apron

until it is forced up in position to be grasped by the rolls 14. The rolls draw the plate upward through the molten metal and as it emerges from the molten metal it enters the space between the nozzles 17. The power having been applied to the pump 28, a sucking action is created by the nozzles 17 and this sucking action acts to draw the oil down into said nozzles, and said oil being drawn with considerable force and rapidity acts to drive the surplus tin from the plate passing up between the nozzles after leaving the tin bath. As the suction is applied across the plate the action will be the same the entire width of the plate so that the removal of the tin is uniform, leaving a substantially uniform coating on the tin as it passes beyond the nozzles. The oil and tin drawn in by the suction of the nozzles 17 is carried by the pump 28 through the pipes 23, 24, 25 and 26 into the pump whence it is discharged through the pipe 31. As there will be a certain amount of refuse and foreign matter in the tin and oil as it comes from the pump, I have provided the strainer 32 by means of which the oil and tin are strained before they pass back again into the pot to be used again in the tinning process.

By my improved process I provide for the removal of the surplus or waste tin, leaving a coating of sufficient thickness and of substantial uniformity upon the plate, while at the same time any foreign matter or dirt is removed, giving a surface of unusual quality. The process further greatly expedites the process of tinning and reduces the quantity of palm oil necessary, as there is absolutely no waste and the surplus oil and tin removed is all carried back into the pot again to be re-used. By drawing off the oil and tin in this method, better opportunity is afforded for filtering the oil and keeping the bath free from foreign matter or impurities.

What I claim as my invention is:

1. A process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten coating metal and through the oil, or similar substance, thereon and applying suction at a point adjacent to the sheet and extending across the same as said sheet passes through said oil.

2. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten metal and through the oil, or similar substance, there-

on and applying suction at a point adjacent to the sheet on opposite sides thereof and extending across the same as said sheet passes through said oil.

3. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten coating metal and through the oil, or similar substance thereon, and applying suction at a point adjacent to the sheet and extending across the same just above the line of the metal.

4. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten coating metal and the oil, or similar substance, thereon, and drawing off by suction applied adjacent to the sheet and across the same, a portion of the oil and with it the surplus tin.

5. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten coating metal and the oil, or similar substance, thereon, applying suction at a point adjacent to the sheet and extending across the same while said sheet passes through said oil and returning the oil and metal so removed to the pot.

6. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten coating metal and the oil, or similar substance, thereon, applying suction at a point adjacent to the sheet and extending across the same while said sheet passes through the oil and filtering, cleaning the oil removed and returning same to the pot.

7. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten metal and through the oil, or similar substance thereon, and drawing the said oil over the surface of said sheet as it passes through the oil.

8. The process of tinning or coating with other metals, consisting in passing the sheet to be coated through the molten metal and through the oil, or similar substance thereon, and drawing the said oil down over the surface of said sheet as it passes through said oil.

In testimony whereof, I the said LAWRENCE C. STEELE have hereunto set my hand.

L. C. STEELE.

Witnesses:

HARRY C. WALLEY,  
S. M. DUMM.