

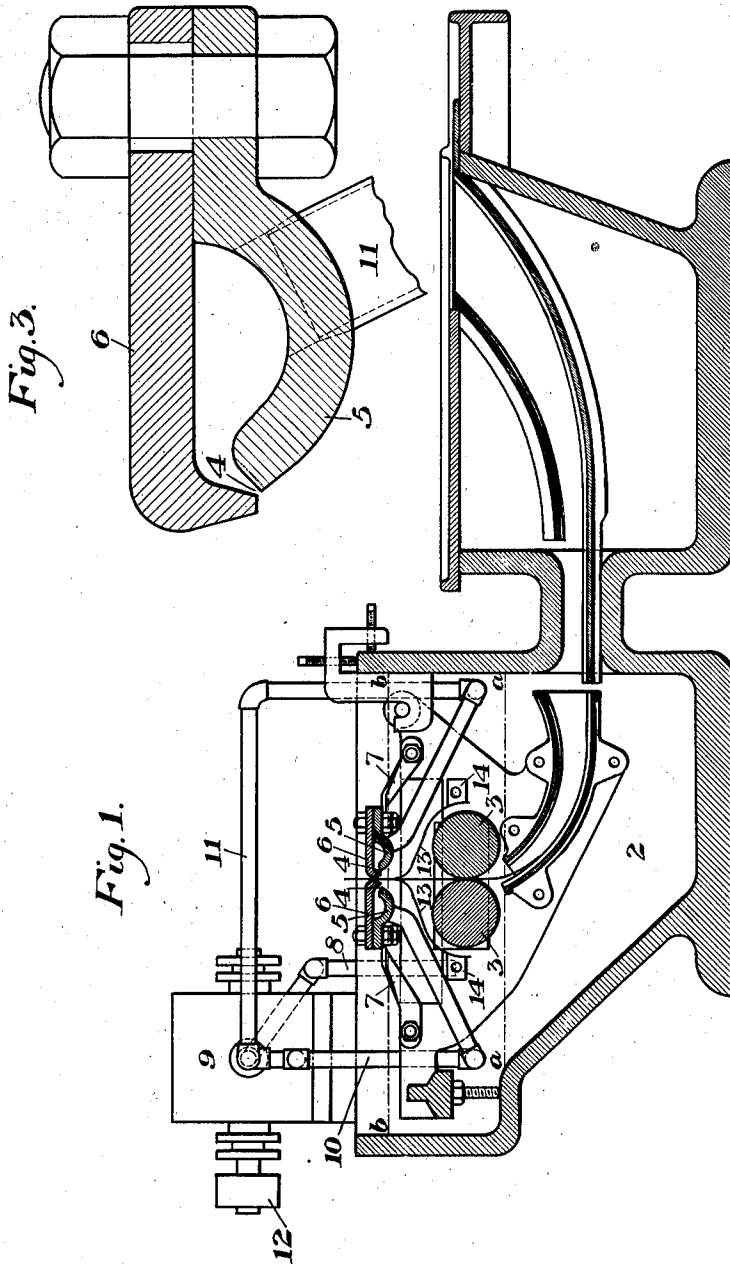
No. 850,548.

PATENTED APR. 16, 1907.

L. C. STEELE.
METHOD OF COATING METAL SHEETS.

APPLICATION FILED DEC. 19, 1905.

2 SHEETS—SHEET 1.



WITNESSES
Warren W. Swartz
R. A. Balderson.

INVENTOR
L. C. Steele
By Ballinger & Dymally
His attys.

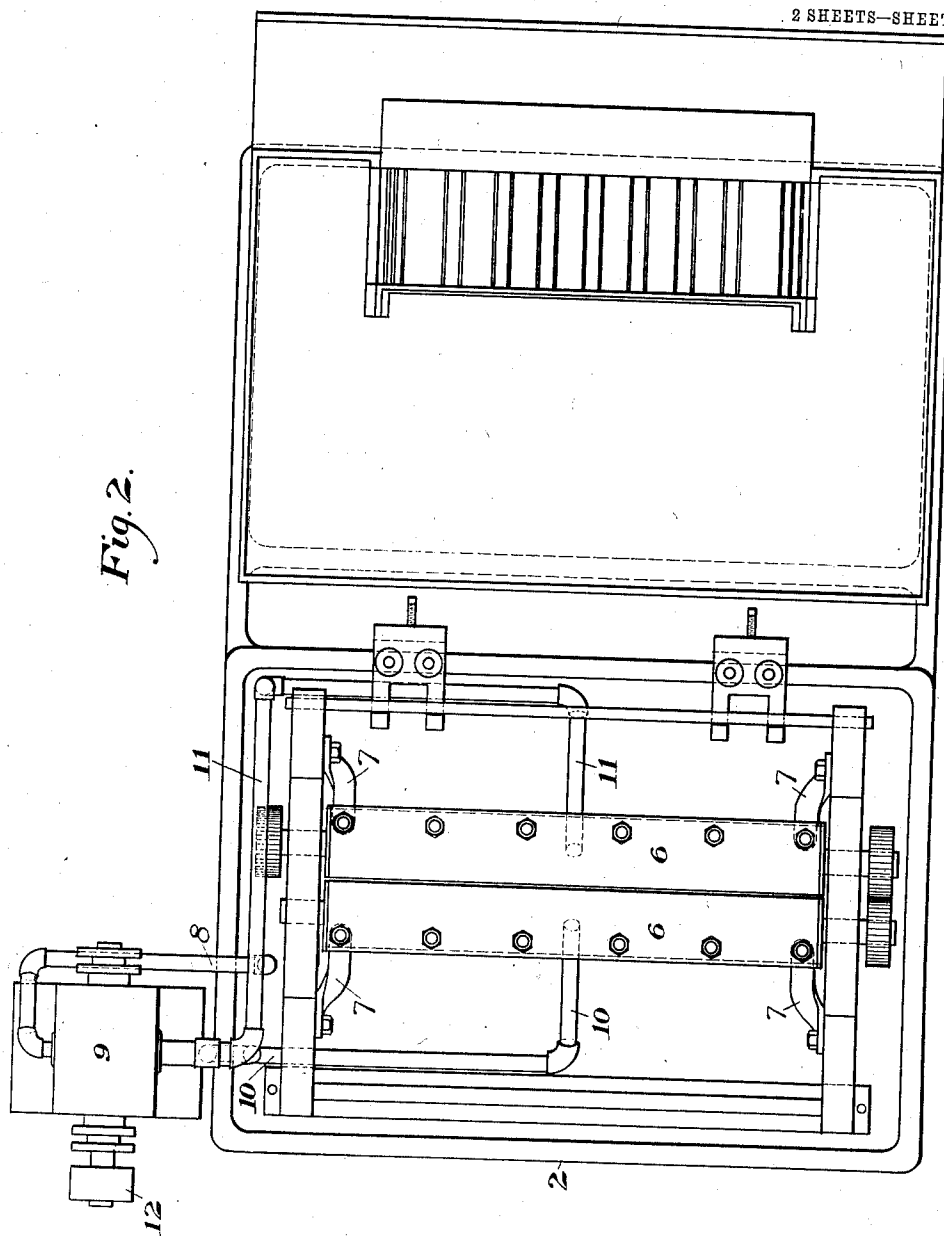
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2 SHEETS—SHEET 2.



WITNESSES

Warren W. Swartz
R. A. Baldwin

INVENTOR

L. C. Steele
by Charles R. Byrnes
his atty

UNITED STATES PATENT OFFICE.

LAWRENCE C. STEELE, OF WHEELING, WEST VIRGINIA, ASSIGNOR TO
AMERICAN SHEET & TIN PLATE COMPANY, OF PITTSBURG, PENN-
SYLVANIA, A CORPORATION OF NEW JERSEY.

METHOD OF COATING METAL SHEETS.

No. 850,548.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed December 19, 1905. Serial No. 292,462.

To all whom it may concern:

Be it known that I, LAWRENCE C. STEELE, of Wheeling, Ohio county, West Virginia, have invented a new and useful Method of
5 Coating Metal Sheets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a longitudinal section showing a tinning-pot provided with my improved apparatus. Fig. 2 is a top plan view of the same, and Fig. 3 is a detail view of the spraying devices.

15 My invention relates to the coating of sheets with metal, and especially to the making of tin-plate, though it may be used in galvanizing sheets or coating them with other metals.

20 Heretofore after the sheet has fed up through the last pair of rolls in the bath of tin it has passed between a pair of plain rolls, which turned in the oil floating on the top of the bath. These last rolls were pressed
25 together, so that they squeezed the surplus tin from the sheet and made the coating more uniform. By the use of such apparatus the speed of the sheet-feeding was necessarily slow and the amount of the coating
30 could not be controlled as desired. Furthermore, as the squeezing-rolls acted upon the coating while hot and green they affected the gloss and injured the appearance of the sheets.

35 My invention is designed to provide a method whereby the amount of the coating can be better controlled. It is also designed to provide for driving the machine at a higher speed than was possible with the old
40 method and also to give an oil-finish to the plate by which its appearance is improved.

My invention consists, broadly, in driving a liquid, preferably in a heated condition, against the coated face of the plate as it
45 rises from the coating-bath. I have found by experiment that where a liquid, such as oil, is thus forced against the face of the plate the amount of metal on the plate may be regulated by regulating the force of the
50 liquid driven against the plate-face. The liquid may consist of the coating metal itself in molten condition or it may be another liquid, such as oil, whether heated or cold.

In the drawings, in which I show a preferred form of the apparatus as applied to
55 the manufacture of tin-plate, 2 represents a tinning-pot of any desirable type, 3 3 being the last pair of tinning-rolls.

The oil-rolls which have heretofore been employed, and which rotate in the oil lying
60 on the bath, are preferably done away with, and in their place I provide the spray devices 4 4. Each such device is shown as consisting of a long channel or receptacle formed of a lower plate 5 and upper plate 6.
65 These plates are bolted together and supported at their ends by brackets 7, secured to the frame of machine.

The upper plate 6 is preferably provided with elongated slots where the securing-
70 bolts extend through it, so that it may be adjusted back and forth on the lower plate, thus adjusting the size of the jet-opening 4, through which the liquid is forced downwardly and outwardly in a continuous sheet.
75

In the form shown the liquid-tin bath may extend to about the level *a a*, while the oil will extend up to about the level *b b*. The
80 hot oil thus lying on the bath is pumped up through the pipe 8 into the centrifugal pump 9 and is discharged through the pipes 10 and 11. Each of these pipes leads to one of the jet devices, being preferably joined
to the lower plate, as shown.

In the operation of the device the pump
85 may be driven by a belt extending to pulley 12 or in any other suitable manner and will act to continuously pump up the hot oil from the top of the bath and drive it through the jet devices in the form of sheets, which strike
90 the opposite faces of the rising plates at a downward angle. These sheets of oil may either strike the plate above the level where it leaves the oil-bath or substantially at this level or even below it. The action of the hot
95 oil is to wipe or drive off a portion of the coating metal, the amount which is removed depending upon the regulation of the jets as to speed, size, volume of fluid, pressure, &c.

In order to prevent the oil which is driven
100 down upon the sheet-faces from running down upon the rolls 3, I preferably employ the curved spring-shields 13, which are secured at their ends to brackets 14 in the oil-bath and which are curved upwardly and
105 preferably fit together with light pressure in

line with the nip of the rolls 3. As the tin sheet feeds upwardly it will be forced between these spring-guards, while the oil and metal will be deflected outwardly as they flow down, and thus be carried over the rolls 3.

The advantages of my invention will be apparent to those skilled in the art. By regulating the jet action of the liquid, which may of course be changed in direction as well as in size of opening, volume, pressure, &c., the amount of coating metal on the plate can be regulated as desired. For the same reason the tinning-machine may be operated much more rapidly than with the old method, since there is no danger of carrying the metal around and redepositing it on the plate, the oil-rolls being preferably done away with. The plates are of fine quality and appearance, since doing away with the oil-rolls prevents dryness or dimming of the gloss of the coating.

The liquid forced against the sheet may consist of the coating metal itself or of any other liquid, whether hot or cold. The invention is applicable to the coating of sheets with any metal. The means for forcing the jet against the face may be varied, as may the other parts of the apparatus, without departing from my invention.

I claim—

1. The method of coating metal plates or sheets, consisting in feeding them upwardly from a molten-metal coating-bath, and forcing a liquid against the face of the upwardly-moving plate, above and after it leaves the molten-metal bath; substantially as described.

2. The method of coating metal plates or sheets, consisting in feeding them upwardly from a molten-metal coating-bath, and forcing a liquid against the face of the upwardly-moving plate, above and after it leaves the molten-metal bath; substantially as described.

3. The method of coating metal plates or sheets, consisting in feeding them upwardly through a bath of molten coating metal, and forcing a jet or sheet of liquid against both faces of the plate after it leaves and while it is

moving upwardly above the molten-metal bath; substantially as described.

4. In the process of coating metal plates with molten metal, the step consisting of driving a jet or sheet of liquid against the face of the plate as the successive portions of the plate leave a coating-bath; substantially as described.

5. In the process of coating metal plates with molten metal, the step consisting of driving a downwardly-directed sheet of liquid against the face of the plate as it is moved upwardly above a coating-bath; substantially as described.

6. In the process of coating metal plates with molten metal, the step consisting of driving a sheet or jet of liquid other than the coating metal against the face of the plate after it has left and as it is moving upwardly above the molten-metal coating-bath; substantially as described.

7. The method of tinning, consisting in feeding the plate upwardly from the molten-metal bath through oil, and forcing the oil against the face of the plate; substantially as described.

8. The method of tinning, consisting in feeding the plate upwardly from the molten-metal bath through oil, and forcing sheets of hot oil against the opposite faces of the rising plate; substantially as described.

9. The method of tinning, consisting in feeding the plate upwardly from the molten-metal bath through oil, and pumping oil from the bath and driving it against the faces of the rising plate; substantially as described.

10. The method of coating metal sheets or plates, consisting in feeding them upwardly from a molten-metal coating-bath, and forcing a heated liquid against the face of the plate, after it leaves the molten-metal bath; substantially as described.

In testimony whereof I have hereunto set my hand.

L. C. STEELE.

Witnesses:

JOHN MILLER,
H. M. CORWIN.