

(No Model.)

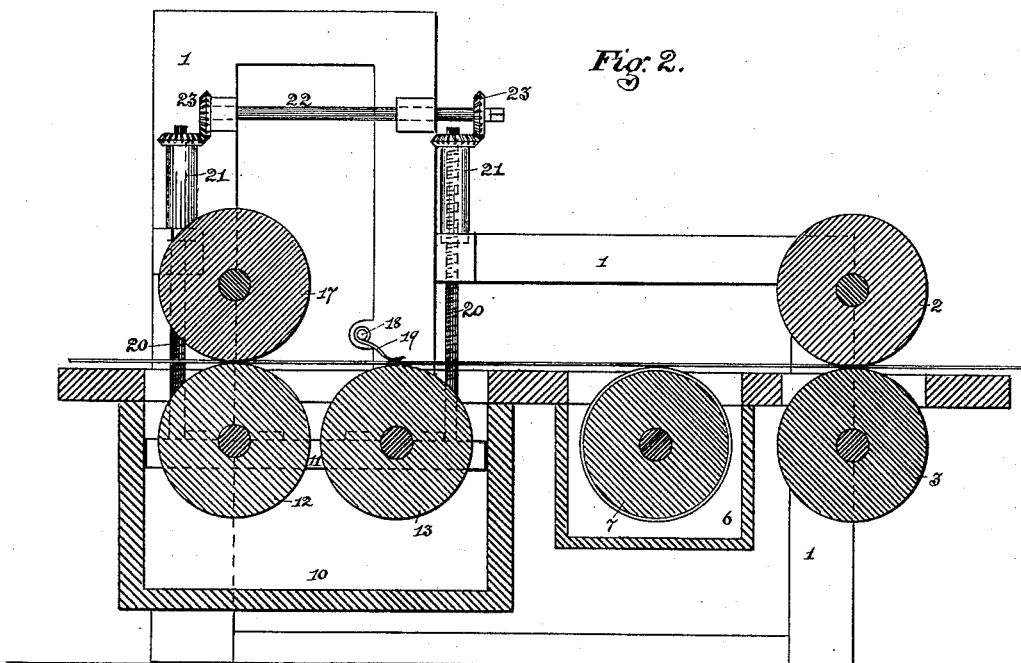
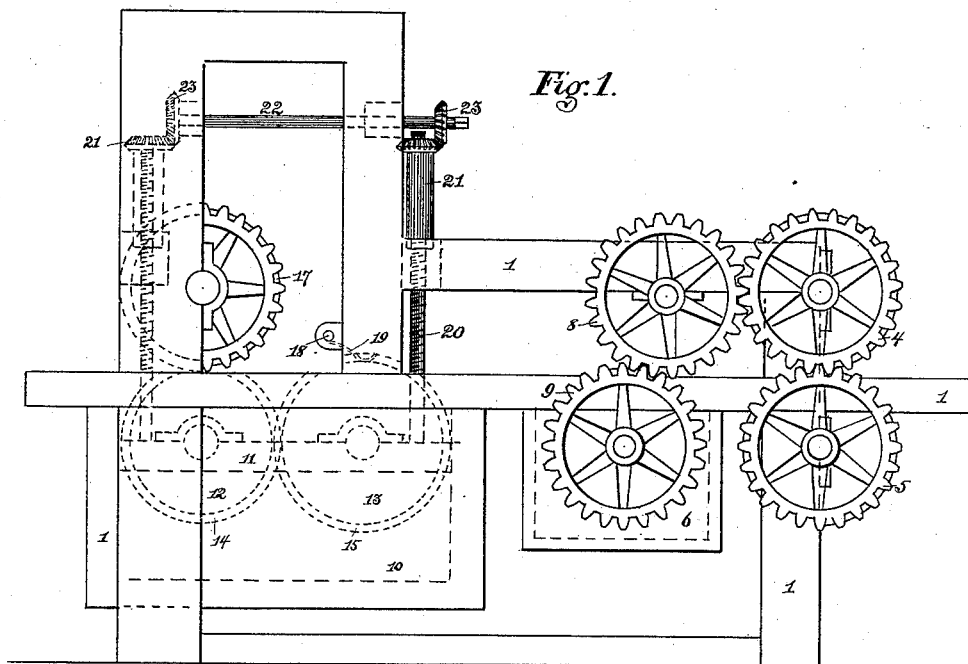
2 Sheets—Sheet 1.

D. EVANS.

MACHINE FOR TINNING COPPER SHEET.

No. 383,116.

Patented May 22, 1888.



Witnesses  
*S. Williamson,*  
*W. T. Haviland,*

Inventor,  
*David Evans,*  
by *Smith and Hubbard,*  
attorneys.

(No Model.)

2 Sheets—Sheet 2.

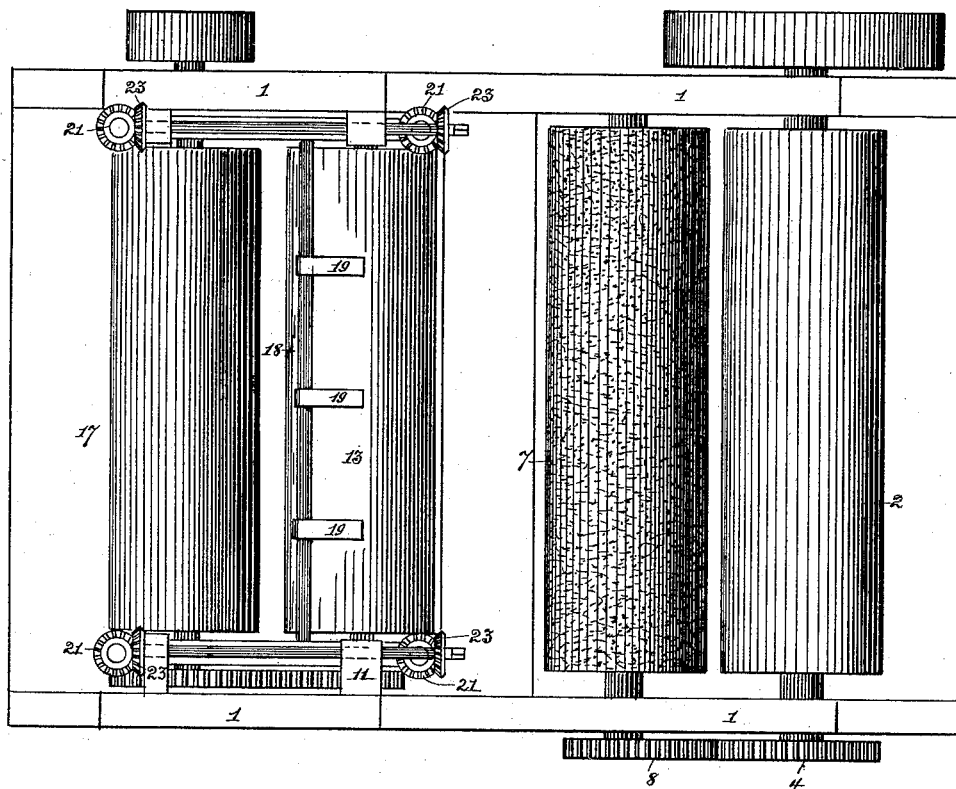
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*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

DAVID EVANS, OF ANSONIA, CONNECTICUT.

## MACHINE FOR TINNING COPPER SHEETS.

SPECIFICATION forming part of Letters Patent No. 383,116, dated May 22, 1888.

Application filed July 28, 1887. Serial No. 245,478. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID EVANS, a citizen of the United States, residing at Ansonia, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Machines for Tinning Copper Sheets; 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 appertains to make and use the same.

My invention relates to certain new and useful improvements in machines for applying to sheet copper or other metal a coating of some different metal, as tin or zinc, but more especially is my invention adapted to be used when it is desired to coat one surface only of the metal to be treated.

Furthermore, it is the object of my invention to furnish means whereby the coating above set forth may be accomplished rapidly and with but small expense for labor; and with these ends in view my invention consists in the details of construction hereinafter set forth, and then recited in the claims.

In order that those skilled in the art to which my invention appertains may more fully understand how to make and use my improvement, I will describe the same in detail, referring by figures to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation of my machine; Fig. 2, a central longitudinal vertical section, and Fig. 3 a plan view.

Similar figures denote like parts in all the views.

Heretofore the process of tin-coating has been effected in two ways. When it is desired to coat the metal upon both its surfaces, the sheets are dipped into molten metal which adheres sufficiently thereto. In coating upon both sides, a cheaper and more effectual method could hardly be devised than as aforesaid. In coating upon one side only, as is usual for bath-tub sheets and other similar sheets where but one surface is exposed, the melted metal is usually applied with a brush and by hand-labor.

In my machine 1 represents the frame on which the operative parts are mounted.

2 3 are a pair of rolls, the shafts whereof are journaled in the frame. The shaft of the roll 2 carries a pulley, whereby motion is imparted thereto, and gears 4 5 connect the two rolls, so that their motion is uniform. The rolls just described serve both to feed the stock forward to the other operative members of the machine and to flatten the sheets in case they are not plane.

6 is a tank secured to the frame 1 immediately forward of the feeding-rolls. It is adapted to contain an acid, as muriatic, and a brush or swab-roll, 7, is journaled in the frame and adapted to revolve in said tank, its revolution being derived from the feed-rolls through gears 8 9.

10 is a tank or pot secured to the frame and adapted to contain the melted metal used in the treatment of the plates or sheets. In practice a furnace is arranged immediately beneath this pot, but as any ordinary furnace will answer, and as the heating of the metal forms no part of my present improvement, I have not thought it necessary to show it in the drawings. Within tank 10 is fitted and adapted to be raised and lowered, as will be hereinafter set forth, a journal-frame, 11, in which are hung two rolls, 12 13. Said rolls are provided with gears 14 15, of somewhat different diameters, which said gears are connected by an idler, 16.

17 is a roll journaled to the frame and pairing with roll 12. It is in the same vertical plane with said roll 12, and through a gear meshing with 14 communicates motion to the roll last named, and immediately therethrough to roll 13.

18 is a shaft arranged transverse of the machine and provided with presser bars or fingers 19, which are adapted to press the sheets down upon the periphery of the roll 13.

The frame 11 is hung within the tank or pot 10 by means of vertical rods 20, which latter are screw-threaded at their top portions, and pass through long nuts 21, which are journaled in the top portion of the frame. The said nuts are bevel-gearred at their upper ends, and the nuts at either end of the machine are connected by short shafts 22, whereon are arranged gears 23, meshing with the geared tops of the nuts aforesaid. The purpose of this adjustment of

the frame and rolls is that when the machine is not in use said rolls may through the rods and nuts be lowered and entirely immersed in the metal of the tank, since it is injurious to said rolls to remain partially immersed in the said metal. The roll 17 derives its motion from a separate belt, or from any other suitable source of power.

The operation of my machine is as follows:  
10 The plate or sheet is first passed through the rolls 2 3, whereby said plate is both straightened and flattened and fed forward onto the swab-roll or brush, which applies to its under surface muriatic acid from the tank 6, whereby  
15 the said plate is cleaned or pickled and prepared to receive the hot metal, which is next applied thereto. From the swab the plate passes to the roll 13, upon whose surface it is held by the presser-bars. This roll, which  
20 revolves partially in the metal of the tank 10, imparts to the under side of the plate a coating of the said metal. The plate then passes to the last pair of rolls. From the under roll it receives a fresh coating of metal, and between the two rolls the coating is, so to speak,  
25 calendered onto the sheet. The two rolls which turn in the metal I make of steel, to which melted tin will adhere. The top roll, 17, I make of cast-iron, to which said metal  
30 will not adhere.

In this my invention I do not wish to be confined to the precise details of construction which I have herein shown and described, since I can subject the plate to the action of  
35 several successive pairs of rolls, whereby it will receive as many successive coatings of metal and calenderings as desired. Furthermore, a roll might, if desired, replace the spring presser-bars, which I have illustrated.

40 I claim as my invention--

1. The combination, with the feed rolls, of the swab-roll, the metal-carrying roll, and means, as described, for pressing the plate upon its surface, and a pair of calenders arranged beyond the metal-carrying roll, the  
45 lower whereof revolves in the pot of molten metal, substantially as described.

2. In a plate-tinning machine, the combination, with the feeding-rolls and the swab-roll, of the tinning-roll and calender-rolls arranged  
50 behind the swab-roll, the tinning-roll and lower calender adapted to have a vertical movement within the tank, whereby the extent of their immersion may be regulated and varied, substantially as set forth.

3. The combination, with the feeding-rolls of the swab-roll, the metal-carrying roll, and the series of pressure bars or fingers arranged above said metal-carrying roll and adapted to forcibly impose the sheet thereon, of the pair  
60 of calenders arranged behind the said metal-carrying roll, the lower calender adapted to revolve within the molten metal, substantially as set forth.

4. The combination, with the journal-frame  
65 arranged within the metal-tank, and the metal-carrying roll and the calenders journaled in said frame, of the vertical screw-threaded rods 20 and the shafts 22, adapted through the gears to raise and lower said rods, whereby the  
70 journal-frame may be elevated or depressed relative to the metal-tank, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID EVANS.

Witnesses:

S. H. HUBBARD,

S. S. WILLIAMSON.