

(No Model.)

2 Sheets—Sheet 1.

E. NORTON.
TINNING MACHINE.

No. 535,394.

Patented Mar. 12, 1895.

FIG. 1.

2

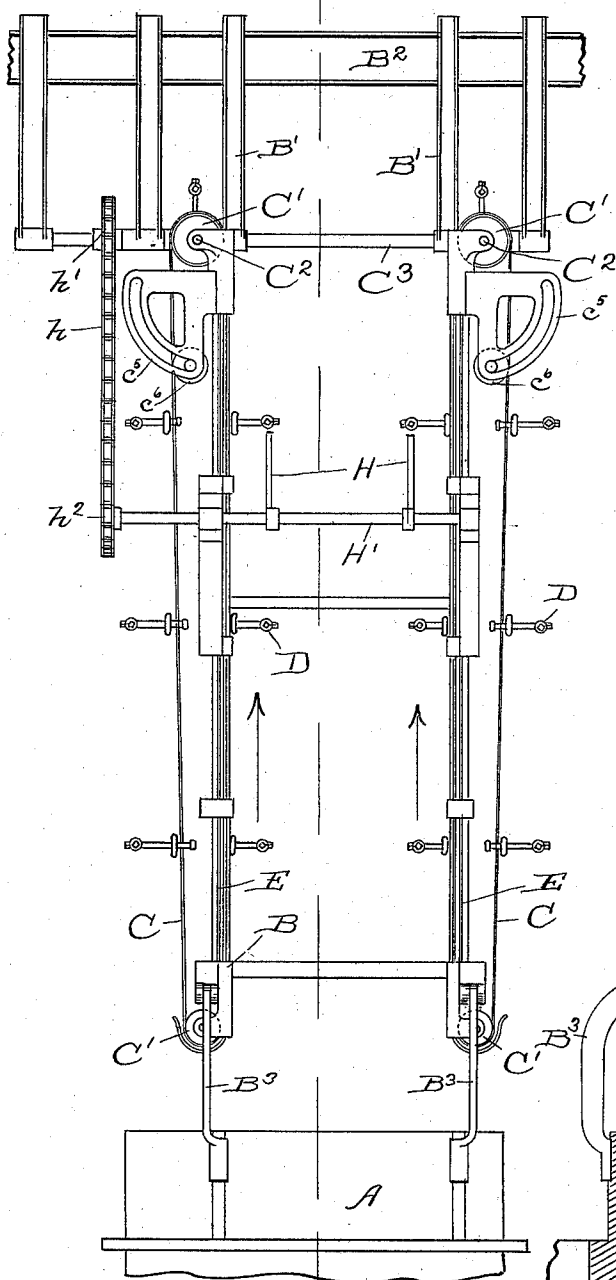
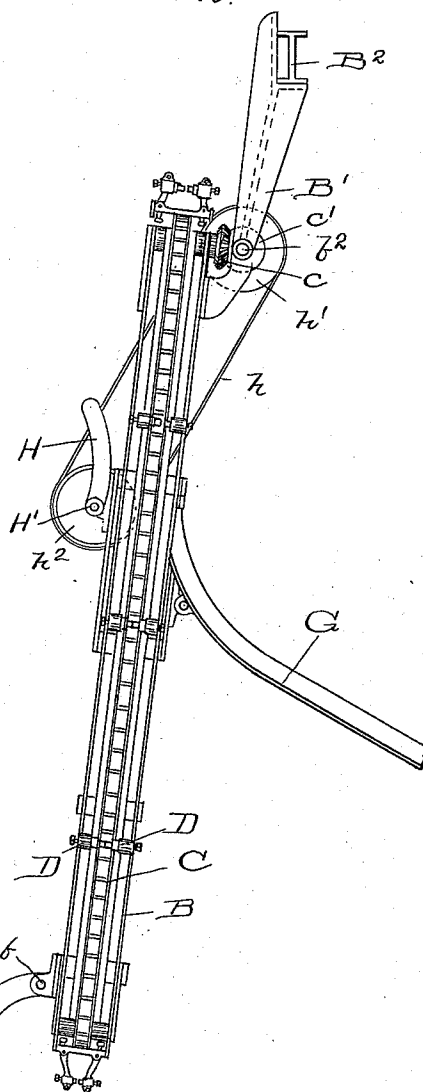


FIG. 2.



WITNESSES:

Sew. C. Curtis
A. W. Munday

INVENTOR:

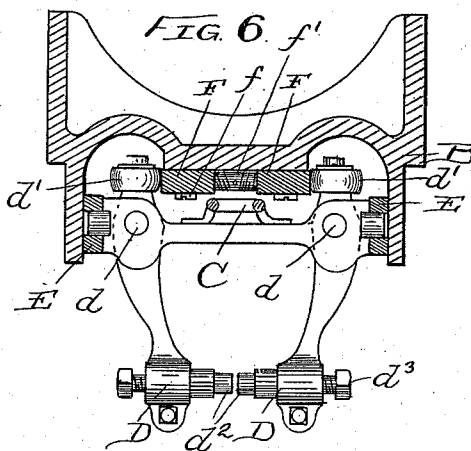
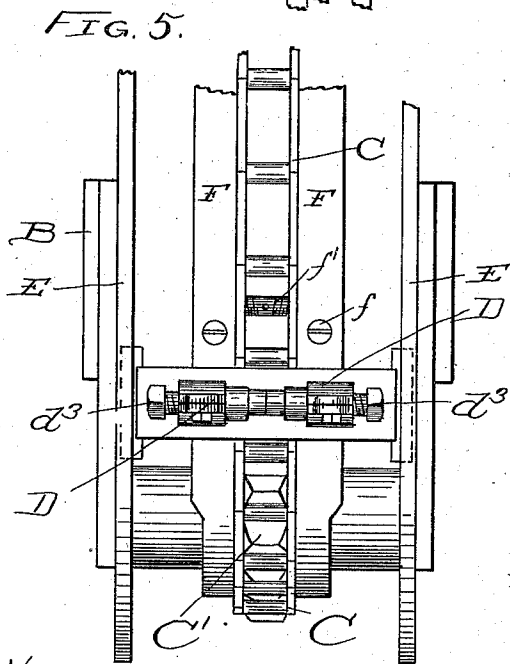
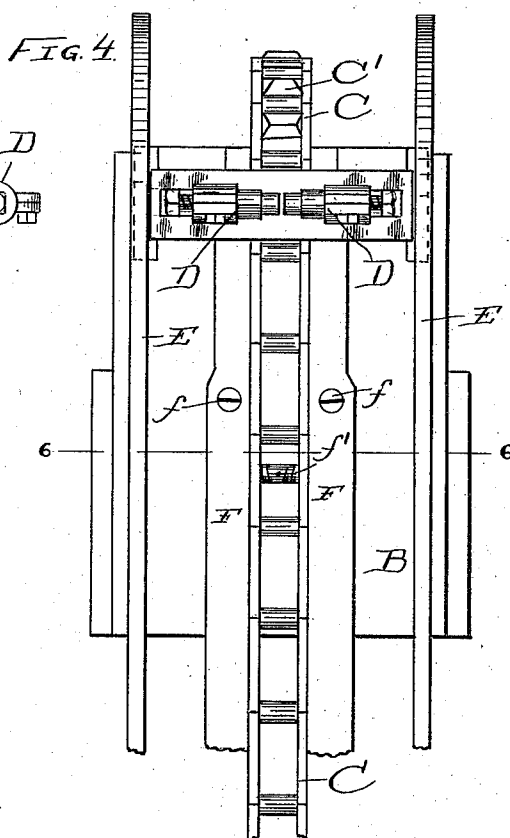
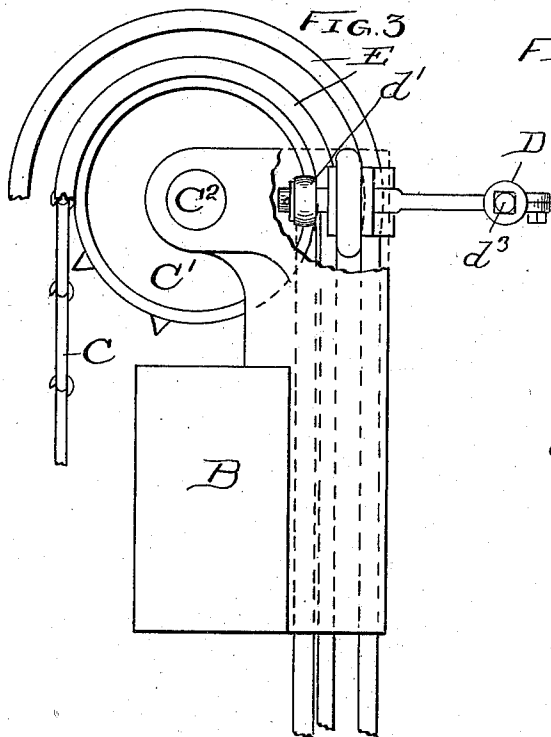
EDWIN NORTON

By Munday, Hart & Adams,
HIS ATTORNEYS

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TINNING MACHINE.

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Sew. E. Curtis
A. W. Munday

INVENTOR:
EDWIN NORTON
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UNITED STATES PATENT OFFICE.

EDWIN NORTON, OF MAYWOOD, ASSIGNOR TO THE NORTON BROTHERS, OF CHICAGO, ILLINOIS.

TINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 535,394, dated March 12, 1895.

Application filed June 18, 1894. Serial No. 514,900. (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 Tinning-Machines, of which the following is a specification.

My invention relates to improvements in machines for coating sheets of steel or iron with tin or other soft metal, and more particularly to means for lifting the tinned sheets out of the tinning pot.

The object of my invention is to provide an efficient sheet lifting device or apparatus of a simple and durable construction to operate automatically to lift or convey the tinned sheets out of the tinning pot without marring or injuring the freshly tinned surfaces of the sheet, and which will operate to support the sheet during a sufficient interval for the tinned coating upon its surfaces to become set. Heretofore this work has been quite generally done by hand, the workman taking hold of the upper edge of the sheet as it issues from the tinning pot with a pair of tongs or pinchers, which he holds in his hands, and the automatic machine embodying my invention is designed to operate in much the same manner. Embodying this tongs or finger or pincher principle of lifting the sheet by grasping it near its edge in an automatic machine, my invention consists, primarily, in a series of pairs of opening and closing fingers or pinchers adapted to grasp the sheet near its edge, in combination with a carrier upon which the series of opening and closing fingers or pinchers are mounted. A double carrier and double series of lifting fingers so that each sheet is grasped at the opposite ends or sides of the sheet and thus evenly supported, also constitute a feature of the invention.

My invention also consists in the novel devices and novel combinations of parts and devices herein shown and described, and more particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts throughout the several figures, Figure 1 is a front elevation of a mechanism embodying

my invention. Fig. 2 is a side elevation. Fig. 3 is an enlarged detail side view of the upper portion of the carrier and its pulley or sprocket wheel. Fig. 4 is a front view of the same. Fig. 5 is a front view showing the lower pulley of the carrier and stationary cams for closing and holding closed the fingers or pinchers by which the sheet is grasped at or near its edge, and Fig. 6 is a cross section taken on the line 6—6 of Fig. 4.

In the drawings A represents the tinning pot and α the finishing rolls in the pot between which the tinned sheet passes and by which it is caused to pass through the portion of the tinning pot containing such rolls and its upper part or edge to issue from the pot in position to be grasped by the lifting device, whether such lifting device be an automatic mechanism or a pair of tongs or pinchers in the hands of a workman. The tinning pot and the rolls in the same may be of any suitable or ordinary construction known to those skilled in the art, and therefore require no special description.

B is the frame of my lifting device, the same extending preferably in nearly a vertical position over the tinning pot, and pivotally connected to and supported by brackets B' at or near its upper end. The brackets B' are secured to the beam B² of the building, or otherwise suitably supported. At or near its lower end the lifter frame B is removably secured by bolts or pins b to brackets or arms B³ preferably attached to the tinning pot.

C C are the conveyers, the same being preferably endless flexible conveyers or sprocket chains, and two in number; and D D are the series of pairs of opening and closing fingers mounted upon these carriers C C. The carriers C C travel upon and are supported and moved by sprocket wheels or pulleys C' C' journaled upon the frame B. The two carriers C C are placed opposite each other and at a sufficient distance apart to give room for the sheet or sheets of tin plate to be suspended between them, as is clearly indicated in Fig. 1.

To properly guide the flexible carrier C C, the frame B is provided with tracks or ways E for each of these chain carriers.

The opening and closing movement of the

lifting fingers D D is preferably provided for by hinging or pivoting the fingers to the carrier, the pivots being indicated at d , and they are preferably closed and held closed so as to properly grasp and support the sheet of tin plate by means of stationary cams F F, which are adjustably fixed to the frame B by screws f , the adjustment of the two cams being further provided for by the right and left threaded adjusting screws f' inserted between these stationary cams. By adjusting the stationary cams a little farther apart the bite or pressure of the pivoted fingers upon the sheet of tin plate will be increased. The movable fingers D are each preferably furnished with an anti-friction roller d' to bear against the stationary cam F. I prefer to mount both of the two fingers D D of each pair pivotally or movably, although it will be obvious to those skilled in the art that the pairs of fingers may be opened and closed to grasp or release the sheet if only one finger of each pair were pivotally or movably mounted upon the carriage. Each of the lifting fingers D is also preferably made independently or individually adjustable. This is preferably done by making each of the fingers in two parts, one adjustable on or in respect to the other. The part d^2 of the finger D, which bears directly against the sheet of tin plate, is preferably made of vulcanite, wood fiber or like material that will not become tinned or tend to mar the hot and more or less soft coating of tin on the sheet as it issues fresh from the tinning pot, and I preferably make this bearing part or pin d^2 adjustable on the main part D of the finger by means of an adjusting screw d^3 .

The conveyer pulleys C' C' of the two conveyers C C revolve in opposite directions, so that the two contiguous or inner loops of the two endless carriers C C will move upward or in the same direction, and thus both co-operate together in lifting and supporting the sheet, one at one edge and the other at the opposite edge of the sheet, as is clearly illustrated in Fig. 1. Two pairs of lifting fingers thus co-operating together grasp and suspend the sheet from its two opposite upper corners, as indicated in Fig. 1. In the slotted segments C⁵ C⁵ are secured the studs upon which are journaled the belt tightener pulleys C⁶ for tightening or taking up the slack in the belts or chains C C.

G is the discharge chute, and H is a device for deflecting the lower edge of the suspended sheet from its hanging or vertical position, so that it will enter the discharge chute when the sheet is released by the opening of the lifting fingers and permit it to descend or drop. This sheet deflector consists, preferably, of one or more, preferably two, revolving arms fixed to a shaft H', the revolution of the shaft being so timed in respect to the movement of the carrier C C, the position of the mouth of the discharge chute and the cams for opening the lifting fingers, that the deflector arms will strike against the sheet after its lower

edge has been raised to about the height of the discharge chute.

The operation is as follows: As the sheets of tin plate issue one after another from the finishing rolls a of the tinning pot A, the upper corners of each sheet are grasped by the opposite pairs of lifting fingers on the carrier C C, and the sheet thus suspended therefrom and conveyed upward for a suitable height and time to give the necessary opportunity for the tin coating to become sufficiently set or cooled to prevent marring or injuring by contact with the discharge chute or sheet deflector device, and then by operation of the stationary cams the lifting fingers are opened and the sheet released, when it descends along the discharge chute, its lower edge being deflected over the mouth of the discharge chute by the deflector H. The hinge or pivot b^2 of the lifter frame B in conjunction with its detachable connection or support b' at its lower end permits the entire lifter to be swung bodily away from the tinning pot when necessary for repairs or other purposes. The upper shafts C² C² carrying the pulleys or sprocket wheels C' C' are geared together by bevel gears $c c'$ and $c c'$, and both receive motion from the same driving shaft C³. The deflector shaft H receives motion from the driving shaft C³ through the sprocket chain h and pulleys h' h^2 . By reason of the series of pairs of opening and closing lifting fingers on the carrier, I am enabled to give the carrier a slow movement and at the same time take the sheets away as fast as they issue from the tinning pot, so that the lifter thus gives ample time for the cooling of the sheets as a number of sheets are being supported and cooled by the lifter at one and the same time.

I claim—

1. The combination with a tinning pot and rolls for conveying the sheet therein, of a lifting device for lifting, conveying and cooling the tinned sheets, consisting of a movable carrier furnished with a series of opening and closing lifting fingers, substantially as specified.

2. The combination with a tinning pot and finishing rolls of a lifter comprising two opposite movable carriers having a space between them sufficient to give room for the sheets, and furnished with a series of pairs of opening and closing lifting fingers, substantially as specified.

3. The combination with a tinning pot and finishing rolls of a carrier, a series of pairs of opening and closing lifting fingers mounted upon it, and a stationary cam for operating the fingers, substantially as specified.

4. The combination with a tinning pot and finishing rolls of two opposite carriers having a space between them to accommodate the sheets, a series of pairs of opening and closing lifting fingers mounted upon said carriers, and cams for operating said lifting fingers, substantially as specified.

5. The combination with a tinning pot and rolls for conveying the sheet therein, of a lifting device for lifting, conveying and cooling the tinned sheets, consisting of a movable carrier furnished with a series of opening and closing lifting fingers, and a discharge chute, substantially as specified.

6. The combination with a tinning pot and finishing rolls of a lifter comprising two opposite movable carriers having a space between them sufficient to give room for the sheets and furnished with a series of opening and closing lifting fingers, and a discharge chute, substantially as specified.

7. The combination with a tinning pot and rolls for conveying the sheet therein, of a lifting device for lifting, conveying and cooling the tinned sheets, consisting of a movable carrier furnished with a series of opening and closing lifting fingers, a discharge chute, and a device for deflecting the lower edge of the sheet over the mouth of the discharge chute, substantially as specified.

8. The combination with a tinning pot of a lifter comprising two opposite movable carriers having a space between them sufficient to give room for the sheets, and furnished with a series of pairs of opening and closing lifting fingers, a discharge chute, and a sheet deflector device at the upper end of the discharge chute to deflect the lower edge of the sheet over the mouth of the discharge chute, substantially as specified.

9. The combination of a tinning pot with two endless flexible carriers mounted upon wheels or pulleys revolving in opposite directions, said carriers being opposite each other with a space between to accommodate the sheets, and a series of pairs of opening and closing lifting fingers mounted upon each of said carriers, substantially as specified.

10. The combination of a tinning pot with two endless flexible carriers mounted upon

wheels or pulleys revolving in opposite directions, said carriers being opposite each other with a space between to accommodate the sheets, and a series of pairs of opening and closing lifting fingers mounted upon each of said carriers, and cams for operating said lifting fingers, substantially as specified.

11. The combination with a tinning pot of two endless flexible carriers mounted upon wheels or pulleys revolving in opposite directions, said carriers being opposite each other with a space between to accommodate the sheets, and a series of pairs of opening and closing lifting fingers mounted upon each of said carriers, and stationary adjustable cams for closing and holding closed said lifting fingers, substantially as specified.

12. The combination of a tinning pot with two endless flexible carriers, mounted upon wheels or pulleys revolving in opposite directions, said carriers being opposite each other with a space between to accommodate the sheets, and a series of pairs of opening and closing individually-adjustable lifting fingers mounted upon each of said carriers, substantially as specified.

13. The combination with a tinning pot of a hinged or pivoted lifter frame above the pot and a carrier provided with lifter fingers mounted on said hinged lifter frame, substantially as specified.

14. The combination with a tinning pot of a carrier, and a series of opening and closing lifting fingers mounted on the carrier, each of said lifting fingers being furnished with a bearing part or face of vulcanite or equivalent non-metallic material, substantially as specified.

EDWIN NORTON.

Witnesses:

H. M. MUNDAY,
EMMA HACK.