

Sept. 5, 1933.

J. CARROLL ET AL

1,925,134

GALVANIZING MACHINE

Filed May 16, 1931

4 Sheets-Sheet 1

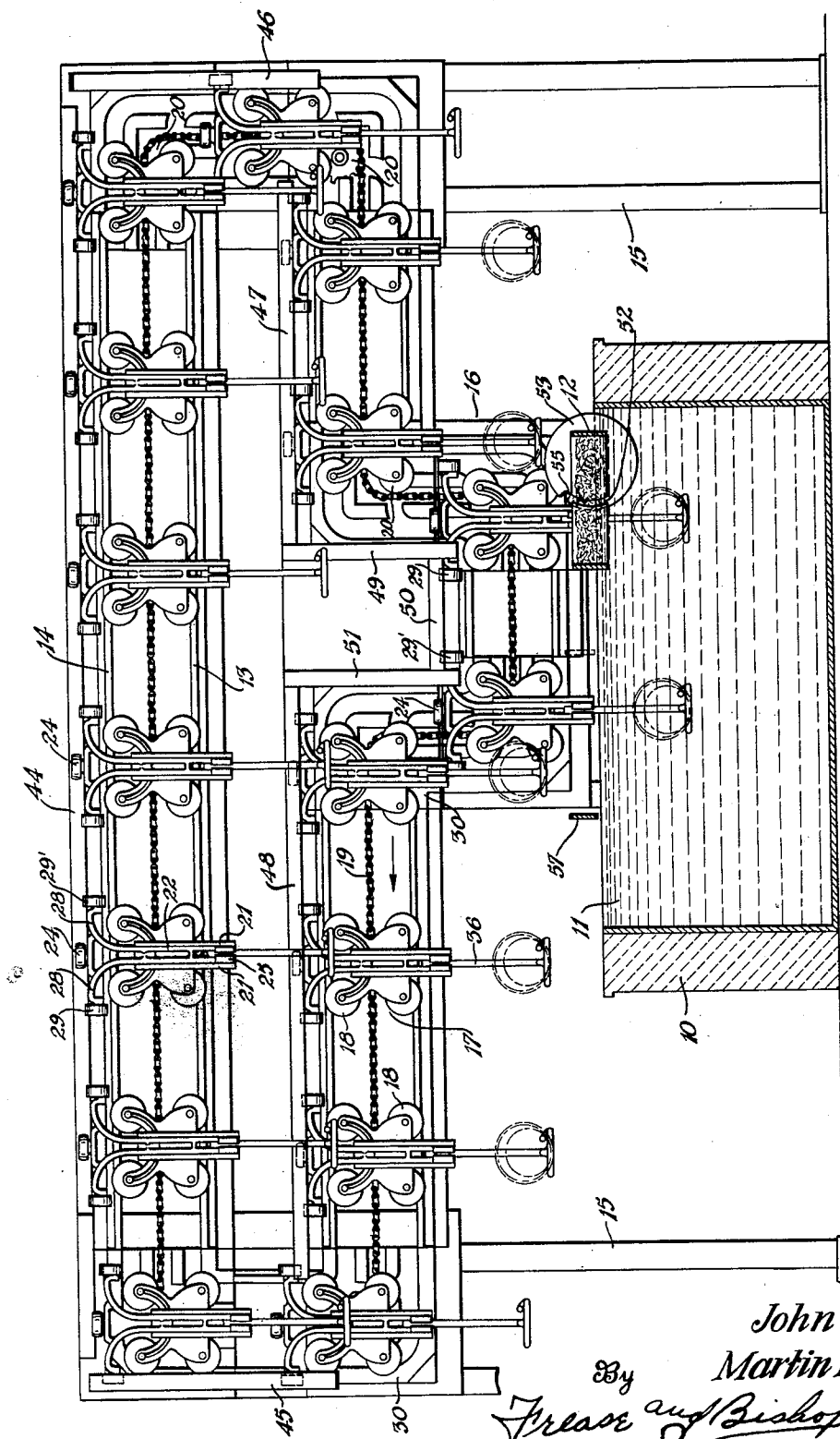


Fig. 1

Sept. 5, 1933.

J. CARROLL ET AL

1,925,134

GALVANIZING MACHINE

Filed May 16, 1931

4 Sheets-Sheet 2

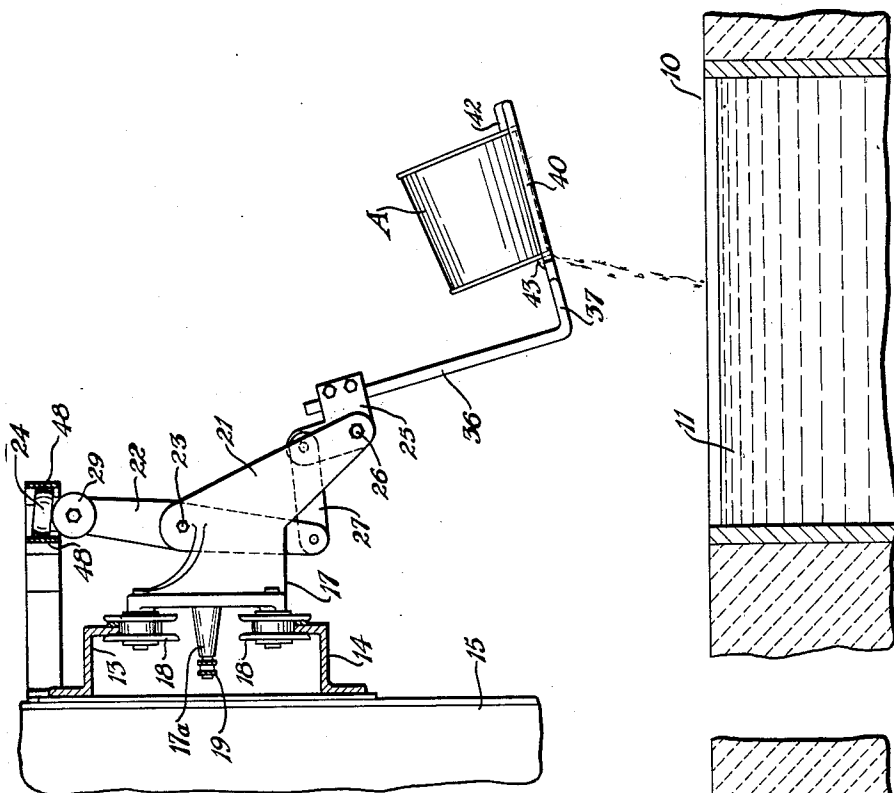


Fig. 3

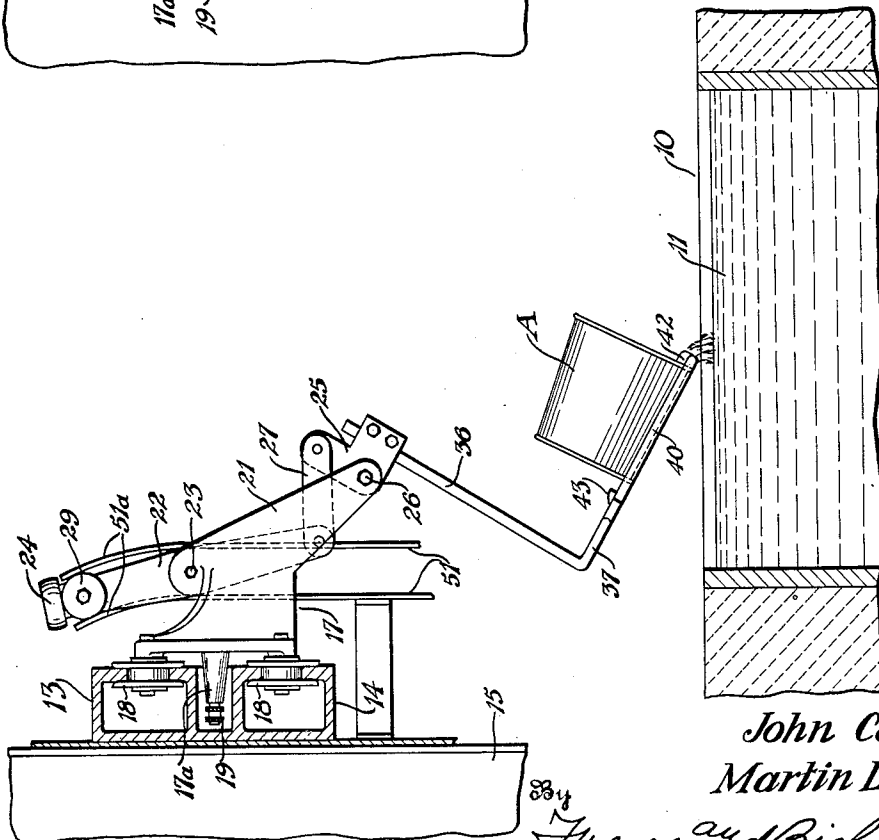


Fig. 2

Inventors

John Carroll
Martin L. Hunker

Freese and Bishop Attorneys

Sept. 5, 1933.

J. CARROLL ET AL

1,925,134

GALVANIZING MACHINE

Filed May 16, 1931

4 Sheets-Sheet 3

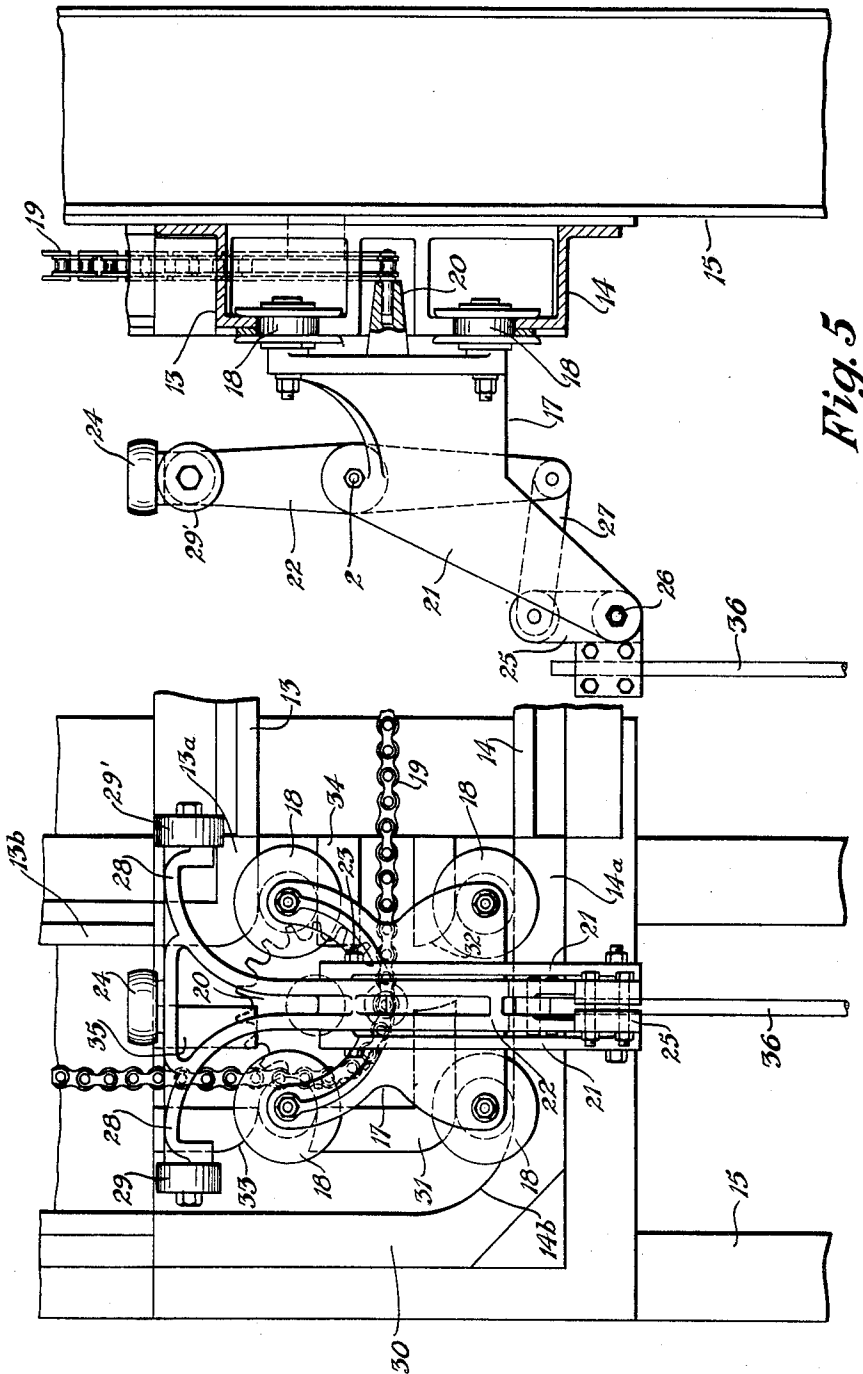


Fig. 5

Fig. 4

Inventors

John Carroll
Martin L. Hunker

By *Freese and Bishop* Attorneys

Sept. 5, 1933.

J. CARROLL ET AL

1,925,134

GALVANIZING MACHINE

Filed May 16, 1931

4 Sheets-Sheet 4

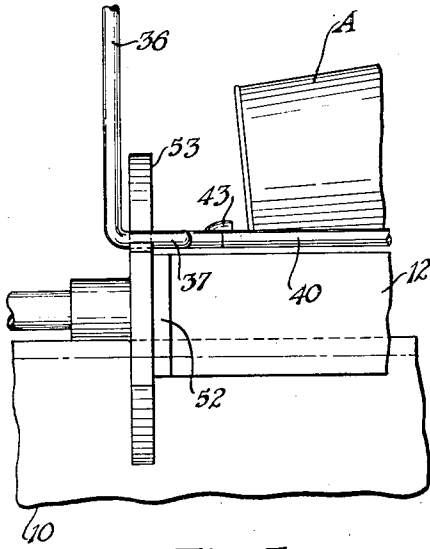


Fig. 7

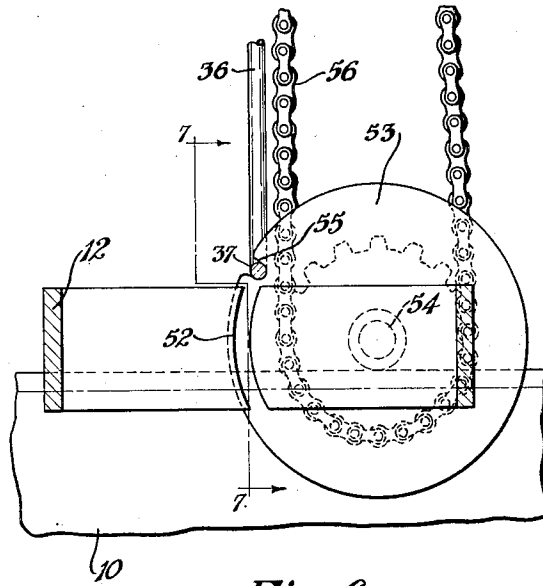


Fig. 6

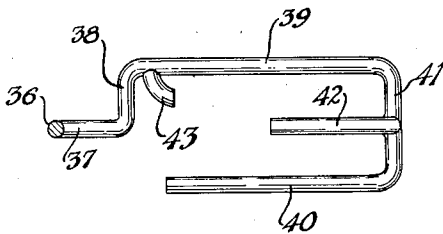


Fig. 8

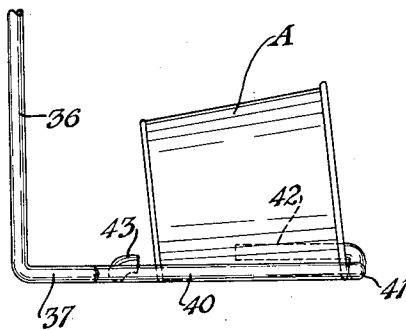


Fig. 9

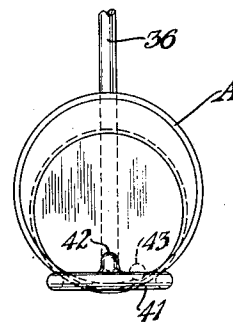


Fig. 10 Inventors

John Carroll

Martin L. Hunkler

By

Grease and Bishop Attorneys

UNITED STATES PATENT OFFICE

1,925,134

GALVANIZING MACHINE

John Carroll and Martin L. Hunker, Dover, Ohio,
assignors to The Reeves Manufacturing Com-
pany, Dover, Ohio, a corporation of Ohio

Application May 16, 1931. Serial No. 537,872

14 Claims. (Cl. 91—12.6)

The invention relates to machines or apparatus for galvanizing, tinning or otherwise coating pails and other metal articles.

The present invention is an improvement upon the type of machine disclosed in Carroll Patent No. 1,787,141, dated December 30, 1930, in which an endless conveyer is provided with a plurality of carriages arranged to be moved around a substantially rectangular track, each carriage having suspended therefrom a frame for supporting a pail or other article to be coated.

Although machines constructed in accordance with the Carroll patent above referred to are operating satisfactory to coat pails and the like, it has been found that the construction and arrangement of the parts can be improved in some respects and the object of the present invention is to provide such improvements.

One object of the invention is to provide means at the corners of the track to assist the carriages in passing around such corners.

Another object is to provide an improved form of frame for carrying the pails or other articles to be coated.

A further object is to provide improved means for manipulating the frames which carry the pails.

The above and other objects which will be hereinafter pointed out or which will be obvious from an inspection of the drawings and the following description may be attained by constructing the improved galvanizing machine in the manner illustrated in the accompanying drawings, in which

Figure 1 is an elevation of the improved coating machine, parts being broken in section for the purpose of illustration;

Fig. 2, an enlarged sectional view showing one of the carriages with the frame in the position it assumes just after the pail emerges from the tank of coating material, showing the pail tilted in position to pour the surplus coating material therefrom;

Fig. 3, a similar view showing a slightly later position of the pail to drain the surplus coating material from the chime;

Fig. 4, an elevation of one carriage, showing the same at one corner portion of the track;

Fig. 5, a vertical sectional view of the same;

Fig. 6, a sectional view through the flux box, showing the gate for closing the slot in the flux box;

Fig. 7, a section on the line 7—7, Fig. 6;

Fig. 8, a plan view of the frame for carrying a pail or the like to be coated;

Fig. 9, a side elevation of the same, showing a pail positioned thereon; and

Fig. 10, a front elevation of the same.

Similar numerals refer to similar parts throughout the drawings.

The pot or tank for containing the molten coating metal is indicated generally at 10 and may be of any usual and well known construction, the molten spelter or other coating metal being indicated therein at 11. The flux box 12 is located in the upper portion of the tank 10, preferably near one end thereof, being positioned at the point where the articles to be coated enter the tank.

An endless track comprising the spaced parallel inner and outer rails 13 and 14 respectively is mounted above the metal tank 10, being supported upon any suitable structure such as indicated generally at 15. This track is preferably continuous as best shown in Fig. 1 and of substantially rectangular form with a depending U-shaped portion indicated generally at 16 adjacent to the tank for the purpose of conveying the pails through the coating material, as will be later described.

A plurality of carriages indicated generally at 17 are mounted upon the track and arranged to be moved around the same for conveying the pails or other articles to be coated through the apparatus, each carriage being provided with four flanged wheels 18, one wheel being located at each corner of the carriage whereby two wheels will be in contact with each track rail at substantially all times.

These carriages are preferably connected together in proper spaced relation as by the endless chain 19, being preferably attached to the boss 17a upon the rear side of each carriage for the purpose of moving all of the carriages in unison around the endless track.

The endless chain 19 may be located over the sprocket wheels 20 positioned at the several bends in the track and one of these sprockets may be driven by any suitable power means, not shown, in order to drive the chain in the direction of the arrow shown in Fig. 1.

A pair of spaced depending brackets 21 is provided upon the outer or front side of each carriage and a substantially vertical lever 22 is pivoted intermediate its ends as at 23 to the upper portions of said brackets and provided at its upper end with a horizontal roller 24.

A bell crank 25 is pivoted between the lower ends of the brackets 21 as indicated at 26, the upper arm thereof being connected by a link 27 with the lower end of the lever 22. The upper

end of the lever 22 is provided with the oppositely disposed angular arms 28 upon the outer ends of which are journaled the vertical rollers 29 and 29'.

5 For the purpose of properly guiding the carriages around the corners or bends of the track, each corner is constructed in the manner illustrated in Fig. 4. As shown in this figure, a plate or casting 30 is supported at the corner portion of the track and provided with angular continuations of the inner and outer tracks as indicated at 13a and 14a respectively.

15 Spaced from the outer track portion 14a a sufficient distance to engage the upper sides of the two lower wheels 18 of the carriage is formed a right angle track portion 31, the lower leg thereof being cut out as at 32 in line with the vertical portion 13b of the inner track, the upper leg of said angular portion 31 being cut out as at 33 in line with the horizontal portion 13 of said inner track.

25 The horizontal and vertical track portions 34 and 35 are spaced from the corresponding sides of the angular track continuation 13a a distance sufficient to permit the wheels 18 to pass therebetween. As the carriage passes around this corner the two lower wheels 18 thereof will pass under the lower or horizontal arm of the track portion 31 while the two upper wheels thereof will pass over the horizontal track portion 34.

30 As the lower left-hand wheel passes around the bend 14b, the lower right-hand wheel will pass up through the cut-out portion 32, the upper right-hand wheel will pass out of contact with the track portion 34 and into contact with the track portion 35 and the upper left-hand wheel will pass through the cut-out portion 33, thus holding the wheels of the carriage substantially in contact with the track throughout the entire operation thereof and preventing any undesirable swinging or twisting of the carriage in negotiating the bends in the track.

35 All of the other corners or bends in the track are formed in the same manner as illustrated and described with respect to Fig. 4, although it should be understood that the parts may be correspondingly reversed for upper, lower, left-hand or right-hand turns.

40 The bell crank 25 upon each carriage supports a frame for carrying a pail or other article to be coated, each frame including a rod 36 depending from the bell crank 25, the lower end of the rod being bent outward or forward at right angles as at 37, then to one side at a right angle as at 38 and then terminating in a normally horizontally disposed U-shaped portion comprising parallel legs 39 and 40 joined at their forward ends as at 41, the leg 39 being a continuation of the portion 38 and the leg 40 terminating at a point spaced from the angular portion 37, as best shown in Fig. 8.

45 A rearwardly disposed finger 42 is connected to the upper side of the portion 41 of the frame and is substantially centrally located between the legs 39 and 40 and preferably of less length than the leg 40.

50 A pail, as indicated at A, may be supported upon the frame, as best shown in Figs. 9 and 10, resting upon the legs 39 and 40 thereof and having the finger 42 extended into the open end of the pail.

55 For the purpose of preventing the pail from sliding backward out of engagement with the finger 42 when the frame is rocked or tilted during the coating operation, as will be later de-

scribed, a curved or angular lug 43 may be provided upon the leg 39 at a proper location to engage within the chime portion of the pail in the event the same slides rearward upon the frame.

60 As the carriages travel toward the right across the upper portion of the track, as viewed in Fig. 1, the rollers 24 thereof may contact with a rail 44 to maintain the levers 22 and rods 36 of the pail supporting frames in substantially vertical position and vertical rails 45 and 46 may be provided at the ends of the track structure for engagement with the rollers 29 and 29' respectively, to assist in maintaining the levers and frames in this position.

65 At the lower right-hand portion of the track structure rails 47 may be provided for maintaining the frames with the pails therein in this position and at the lower left-hand portion of the track structure similar rails 48 may be provided for engagement with the rollers 24 for swinging or tilting the frames, as will be later described.

70 The depending portion 16 of the track structure has associated therewith a vertical rail 49 for cooperation with the rollers 29 of the carriages to maintain the frames in substantially vertical position as the carriages descend, a horizontal rail 50 being provided for engagement with the rollers 24 to maintain the frames in this position as the pails are passed through the coating material and a vertical channel rail 51 being provided for engagement of the rollers 29' of the carriages for swinging the levers 22 and frames to the position shown in Fig. 2 immediately after the pails emerge from the coating material in order to drain the surplus metal therefrom.

75 The flux box 12 is provided in one side with a slot 52 through which the angular portion 37 of each pail supporting frame is adapted to pass downward in order to carry the pail through the flux before it enters the molten zinc or other coating material.

80 For the purpose of keeping this slot closed at all times, so as to prevent the flux from passing through the same onto the surface of the molten coating metal, a gate in the form of a disk 53 is pivoted adjacent the slotted side of the flux box, as indicated at 54, extending over said slot as best shown in Fig. 6 so as to normally seal the same.

85 The gate may be provided with a notch 55 to receive the angular portion 37 of each pail supporting frame and the disk gate is adapted to be driven by any suitable means such as the sprocket chain 56 at the same surface speed as the movement of the carriages. This causes the disk and pail supporting frame to move in unison as the angular portion 37 of each frame passes down through the slot 52 of the flux box and always brings the notch 55 into proper position to receive each frame as it approaches the flux box.

90 The pails to be coated are loaded upon the frames at the right-hand side of the machine, as viewed in Fig. 1, and with the frames hanging in normal or vertical position they are moved to the left and then downward, carrying the pails through the flux box and into the molten metal, then through the molten metal to the left and upward out of the metal.

95 As shown in Fig. 2, immediately after each pail emerges from the molten metal, the roller 29' of the corresponding carriage is received between the spaced rails 51 and as the carriage ascends, the roller passes through the rearwardly curved

portions 51a at the upper ends of said rails, swinging the frame 36 upon the pivot 26 and tilting the open end of the pail forward, discharging the surplus coating material therefrom and re-

turning it to the tank.

As the carriage reaches the top of the depending portion 16 of the track structure and starts to move toward the left, the roller 24 at the upper end of the lever 22 on said carriage is received between the spaced rails 48 which are angled or curved at this point in order to swing the frame into the opposite position, as shown in Fig. 3, draining the surplus metal from the chime of the pail, after which point the rails 48 are so shaped as to move the frame 36 back to the vertical or normal position, carrying the coated pail to the left-hand side of the machine where it may be removed from the frame.

In order to remove the scale, oxide and other matter from the surface of the molten coating material just prior to the time each pail emerges therefrom, a scraper blade, as indicated generally at 57, may be provided for scraping this material from the surface of the coating metal at the point where the pails emerge therefrom, any suitable means being provided for operating said scraper blade.

We claim:

1. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank, and a carriage movable upon said track, a lever pivoted upon said carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to one end of said lever, and means adapted to engage the other end of the lever for swinging said pail supporting frame upon its pivot.

2. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank, and a carriage movable upon said track, a substantially vertical lever pivoted upon said carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to the lower end of the lever, and means adapted to engage the upper end of the lever for swinging said pail supporting frame upon its pivot.

3. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank and having horizontal and vertical portions, and a carriage movable upon the track, a lever pivoted upon the carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to one end of said lever, a roller located at the other end of the lever, a second roller located near said end, means for engaging the first named roller for swinging said frame upon its pivot when the carriage is moved horizontally and means for engaging the second roller for swinging the frame upon its pivot when the carriage is moved vertically upon the track.

4. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank and having horizontal and vertical portions, and a carriage movable upon the track, a lever pivoted upon the carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to one end of said lever, means for engaging the other end of the lever for swinging said frame upon its pivot when the carriage is moved horizontally upon the track, an angular arm at said last named end of the lever and means for engaging said angular arm for swinging the lever upon

its pivot when the carriage is moved vertically upon the track.

5. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank and having horizontal and vertical portions, and a carriage movable upon the track, a lever pivoted upon the carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to one end of said lever, means for engaging the other end of the lever for swinging the frame upon its pivot when the carriage is moved horizontally upon the track, a pair of oppositely disposed angular arms upon said last named end of the lever, means for engaging one arm when the carriage is moved vertically downward, and means for engaging the other arm when the carriage is moved vertically upward.

6. In apparatus for coating pails and the like including a tank of coating material, a track adjacent to said tank and having horizontal and vertical portions, and a carriage movable upon the track, a lever pivoted upon the carriage, a pail supporting frame pivotally connected to the carriage, a link connecting the frame to one end of said lever, a pair of rollers upon opposite sides of the other end portion of the lever, means for engaging one roller as the carriage is moved vertically downward and means for engaging the other roller as the carriage is moved vertically upward.

7. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bands including additional rail members located at the bends and adapted to engage said wheels.

8. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and inwardly spaced from said parallel rails and adapted to engage said wheels.

9. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and adapted to engage said wheels, one of said additional rail members being angular.

10. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and adapted to engage said wheels, one of said additional rail members having cut-out portions to permit certain of the wheels to pass therethrough.

11. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails,

means for guiding the carriages around the angular bends including additional rail members located at the bends and inwardly spaced from said parallel rails and adapted to engage said wheels, one of the additional rail members being angular.

12. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and inwardly spaced from said parallel rails and adapted to engage said wheels, one of said additional rail members having cut-out portions to permit certain of the wheels to pass therethrough.

13. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and

four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and adapted to engage said wheels, one of said additional rail members being angular and having cut-out portions to permit certain of the wheels to pass therethrough.

14. In apparatus for coating pails and the like including a tank of coating material, spaced parallel rails having angular bends therein and forming an endless track adjacent to the tank, and four wheel carriages rolling between said rails, means for guiding the carriages around the angular bends including additional rail members located at said bends and inwardly spaced from said parallel rails and adapted to engage said wheels, one of said additional rail members being angular and having cut-out portions to permit certain of the wheels to pass therethrough.

JOHN CARROLL.

MARTIN L. HUNKER.

25

30

35

40

45

50

55

60

65

70

75

100

105

110

115

120

125

130

135

140

145

150