April 22, 1924. 1,491,461

D. BUCCICONE

TINPLATE FEEDING APPARATUS

Original Filed May 16, 1921 5 Sheets-Sheet 1

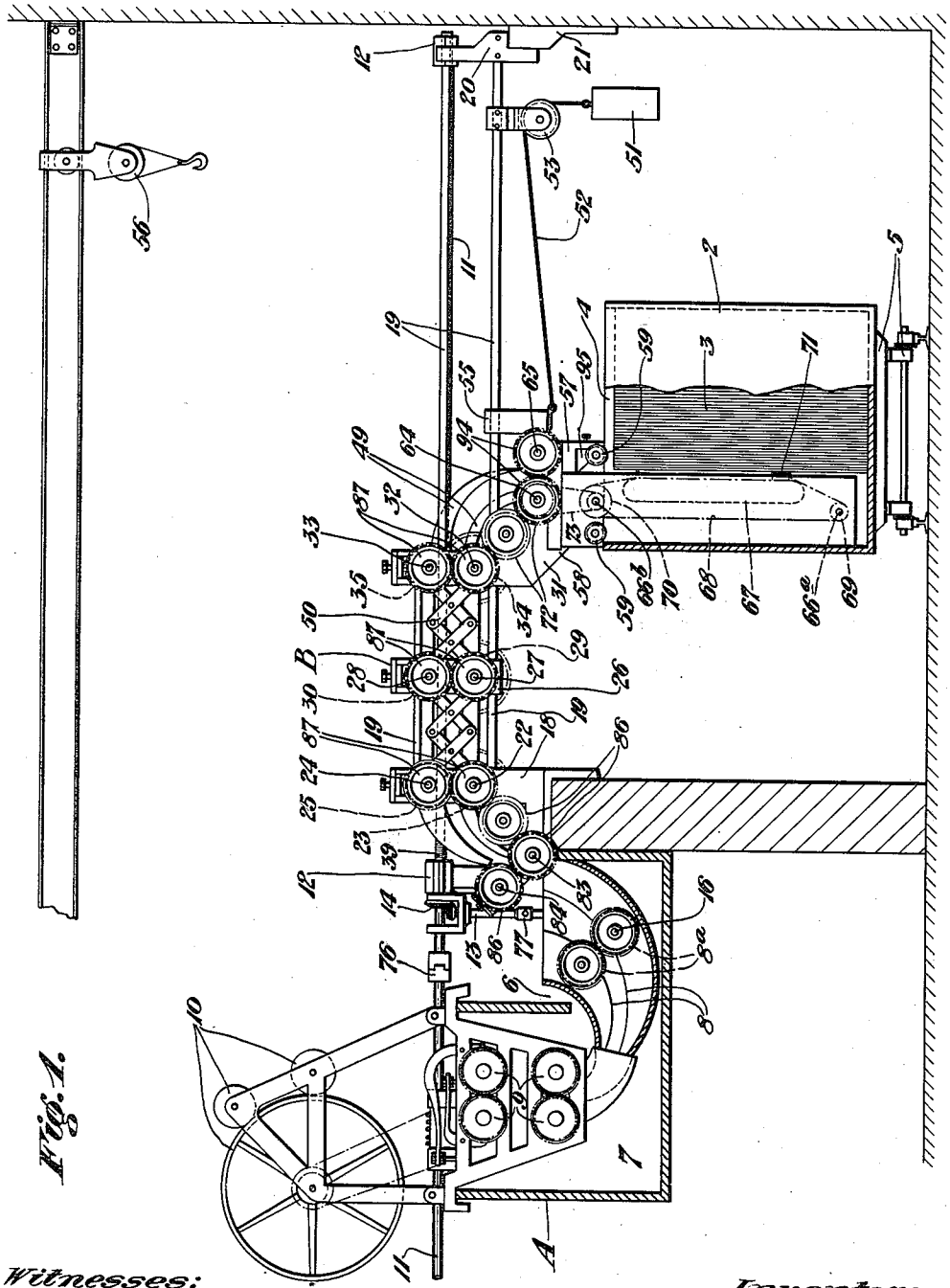


Fig. 1.

Witnesses:
Edwin Trueb

Inventor:
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by:
D. Anthony Mecina
his Attorney.

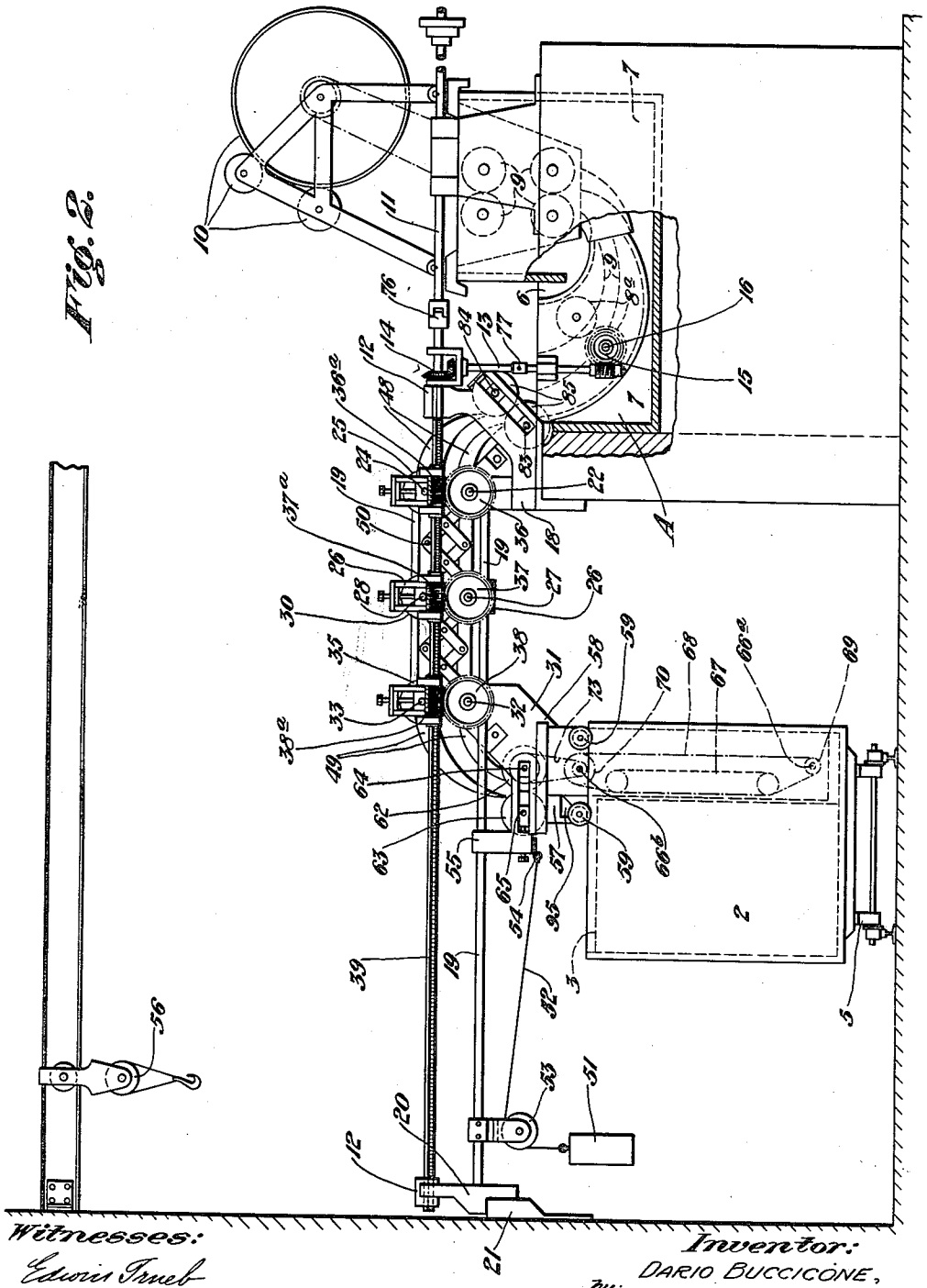
April 22, 1924. 1,491,461

D. BUCCICONE

TINPLATE FEEDING APPARATUS

Original Filed May 16, 1921 5 Sheets-Sheet 2

Fig. 2.



Witnesses:
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April 22, 1924. 1,491,461

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TINPLATE FEEDING APPARATUS

Original Filed May 16, 1921 5 Sheets-Sheet 3

Fig. 3.

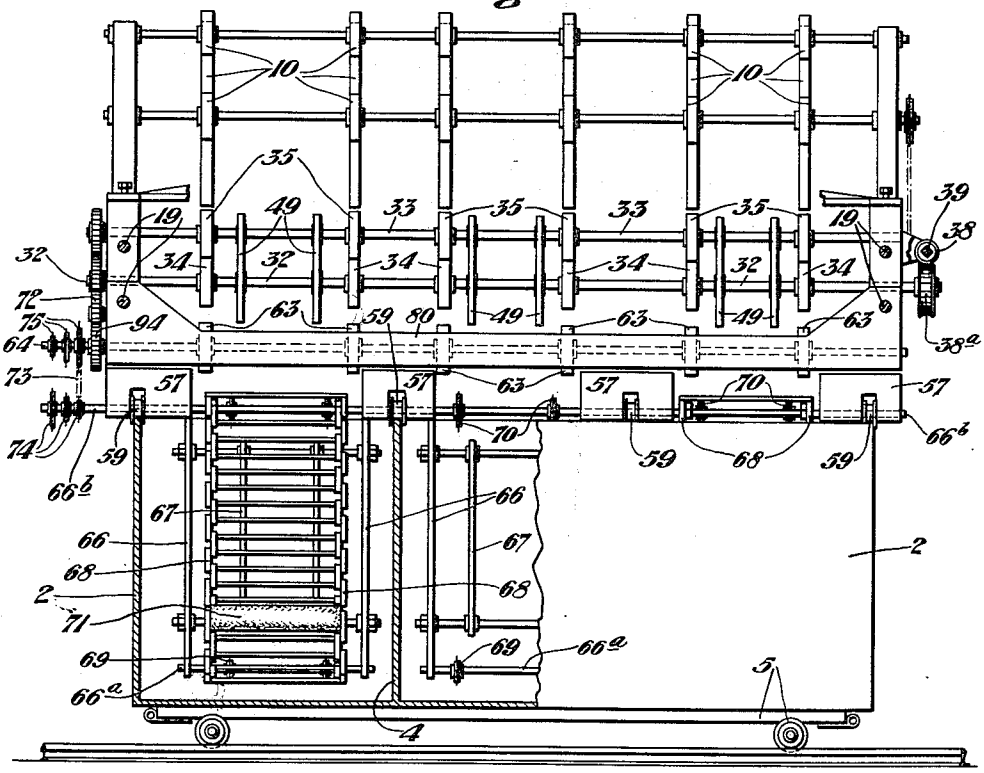


Fig. 13.

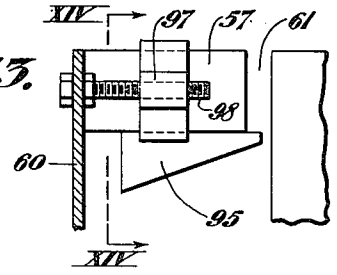


Fig. 14.

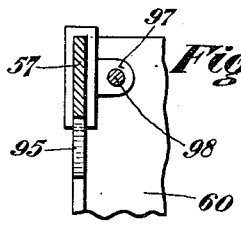


Fig. 15.

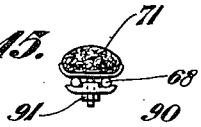


Fig. 16.



Witnesses:
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April 22, 1924. 1,491,461

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TINPLATE FEEDING APPARATUS

Original Filed May 16, 1921 5 Sheets-Sheet 4

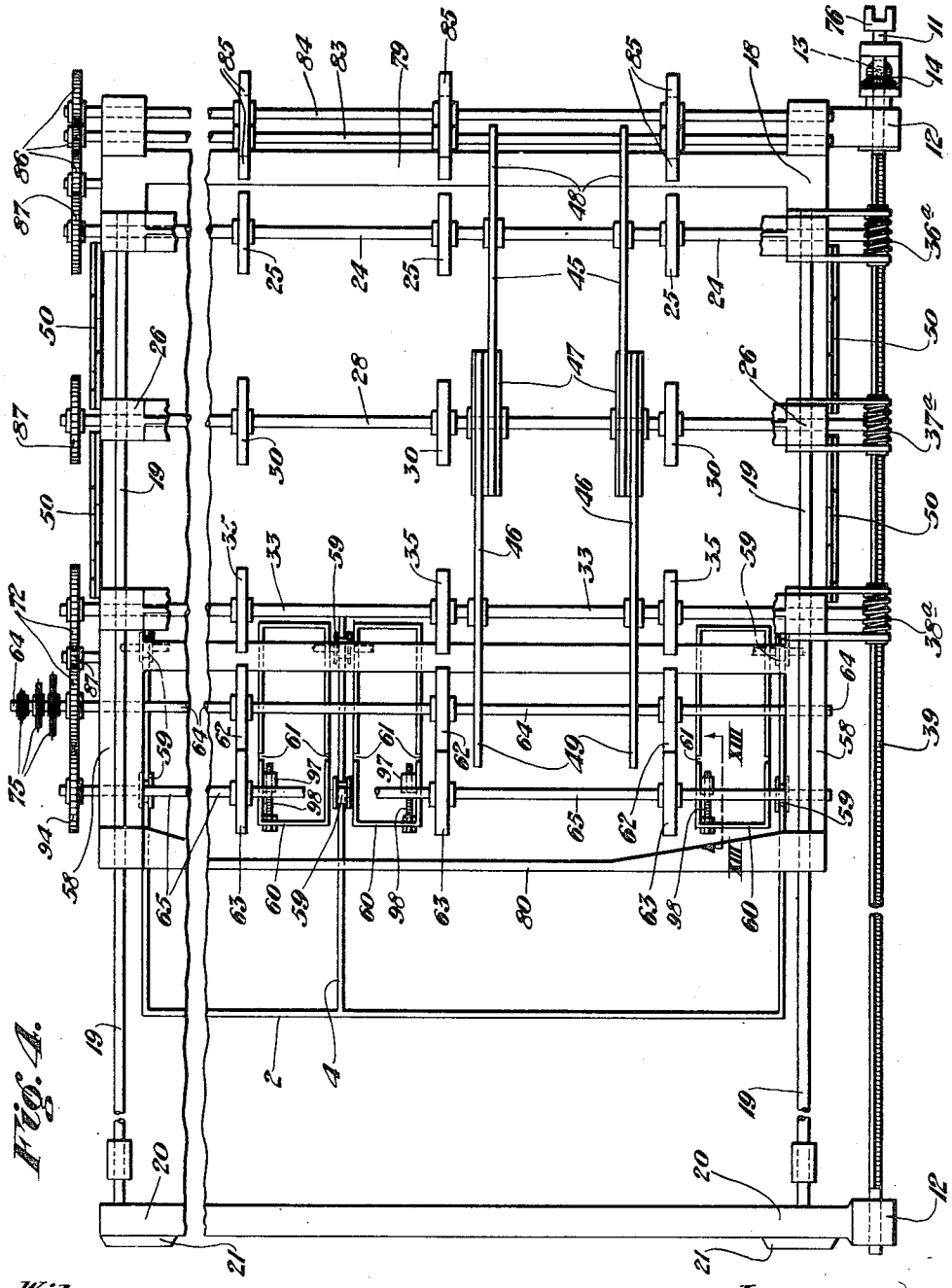


Fig. 4.

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April 22, 1924. 1,491,461

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TINPLATE FEEDING APPARATUS

Original Filed May 16, 1921 5 Sheets-Sheet 5

Fig. 7.

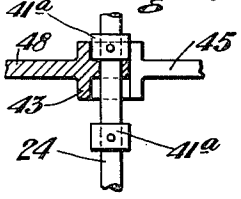


Fig. 5.

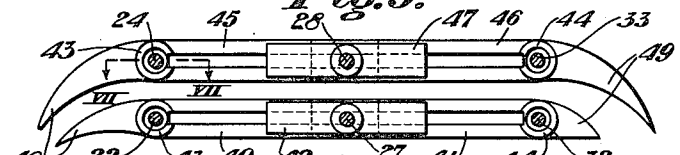


Fig. 6.

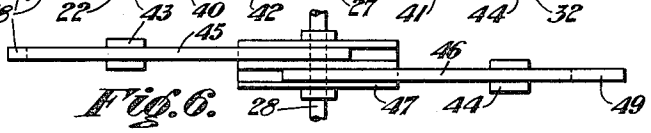


Fig. 8.

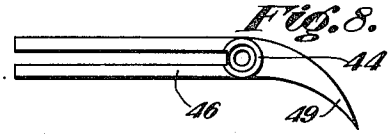


Fig. 9.

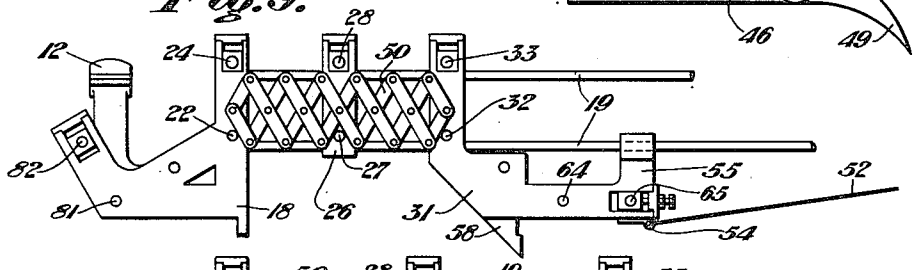


Fig. 10.

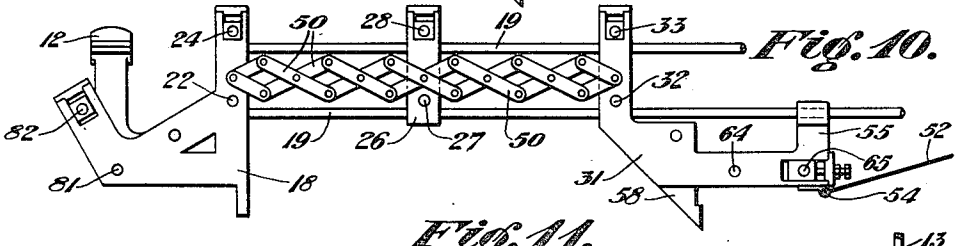


Fig. 11.

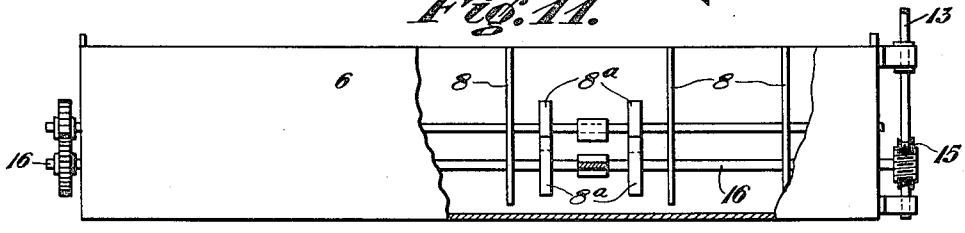
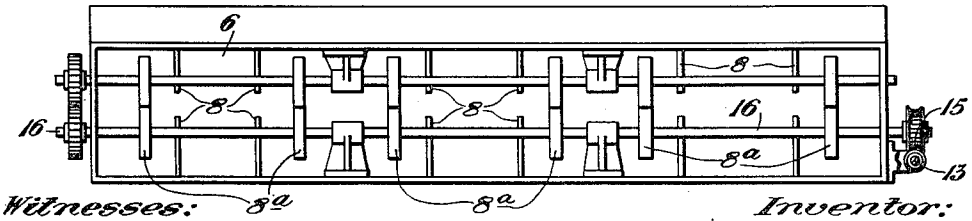


Fig. 12.



Witnesses:
Edwin Trueb

Inventor:
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his Attorney.

Patented Apr. 22, 1924. 1,491,461

UNITED STATES PATENT OFFICE.

DARIO BUCCICONE, OF NEW KENSINGTON, PENNSYLVANIA.

TINPLATE-FEEDING APPARATUS.

Original application filed May 16, 1921, Serial No. 470,073. Divided and this application filed June 2, 1922. Serial No. 567,670.

To all whom it may concern:

Be it known that I, DARIO BUCCICONE, a subject of the King of Italy, and resident of New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Tinplate-Feeding Apparatus, of which the following is a specification.

My invention relates to the manipulation of sheet metal plates, and more particularly to the feeding of such plates one at a time, from a pile or pack to a tinning machine, as described and illustrated in my co-pending application Serial No. 470,073, filed May 16, 1921, (of which this application is a division) which issued as Patent No. 1,422,535 on July 11, 1922.

One object is to provide improved safety means for preventing more than one plate being carried or fed into the tinning machine.

Still another object is to provide relative approach of the elevating means and pack whereby said elevating means is automatically maintained in operative engagement with the outermost plate of said pack.

While my invention is primarily designed for use in delivering plates to tinning machines, and is illustrated in connection with such a machine. The invention is not limited thereto, but may be employed in various other combinations where it is desired to manipulate plates, one at a time, without danger of carrying more than one.

The above and other objects and advantages will be more fully brought out in the following specification and claims, and will be fully illustrated in the accompanying drawings, in which—

Figure 1 is a view partly in longitudinal section and partly in side elevation of an apparatus embodying my invention.

Figure 2 is a view similar to Figure 1 taken on the opposite side of the apparatus.

Figure 3 is a view partly in end elevation and partly in transverse section of the apparatus shown in Figure 1.

Figure 4 is a fragmentary plan view of the feeding and elevating mechanism, partly broken away.

Figure 5 is an elevation of the extensible frame of the feeding mechanism with the feed roller shafts thereof in section.

Figure 6 is a top plan thereof.

Figure 7 is a horizontal section of the same taken on the line VII—VII of Figure 5, with one of the collars displaced.

Figure 8 is an elevation of one of the upper members of the extensible frame of the feeding mechanism.

Figure 9 is a fragmentary elevation of the feeding mechanism collapsed and showing the slidable abutment carriage which engages the elevating mechanism for keeping the latter operatively associated with the plates.

Figure 10 is a view similar to Figure 9 with the feeding mechanism extended.

Figure 11 is a rear elevation of the flux box and associated parts partly broken away.

Figure 12 is a top plan of the device shown in Figure 11.

Figure 13 is a fragmentary section taken on the line XIII—XIII of Figure 4, showing the means for preventing more than one plate being elevated at a time.

Figure 14 is a section taken on the line XIV—XIV of Figure 13.

Figures 15 and 16 are details of the friction pad of the elevating mechanism.

Referring more particularly to the drawings, the numeral 2 designates the bosh or receptacle as a whole, which is adapted to hold water or other liquid in which a pack of plates 3 to be fed are immersed.

The bosh 2 is preferably of multiple construction. That is, divided into a plurality of chambers by partitions 4, and a pack of plates is adapted to be disposed vertically within each of said chambers. As shown, the bosh 2 is mounted upon a car 5 which is designed to be run into a convenient position for the plates to be reached by suitable feed mechanism hereinafter described.

The tinning pot A is divided into two compartments 6 and 7 which are, respectively, adapted to contain a suitable flux and molten tin, and the flux compartment 6 is provided with curved guides 8 between which the plates are to be delivered.

Suitable feed rolls 8^a are also mounted in the flux compartment to feed the plates forward into the compartment 7. The compartment 7 is provided with the usual feed-out rolls 9 adapted to receive the plates from

the rolls 8ª and feed them out of the molten tin and up into engagement with the pinch rolls 10.

Located so as to bridge between the bosh 2 and tinning pot A is a feeding mechanism B adapted to deliver the plates to the tinning pot as they are elevated from the bosh. The feeding mechanism B includes a horizontally disposed power shaft 11 having its ends journaled as at 12, and is geared to a vertical shaft 13 as at 14. The shaft 13 is in turn geared as at 15 to the shaft 16 of the lower one of the sets of rolls 8ª. The shaft 11 is adapted to be rotated by a suitable motor (not shown).

A bracket 18 rests upon each end of the front wall of the tinning pot A, and the rear ends of a pair of supporting rods 19 are fixed in each of said brackets. The rods 19 are disposed in a horizontal plane slightly below the shaft 11 and have their other ends fixed in a suitable supporting block 20, which is secured to a bracket 21 secured to a wall of the building. A shaft 22 has its ends journaled in the brackets 18 and has a plurality of friction wheels 23 fixed thereon at intervals. Another shaft 24 is journaled in vertically adjustable bearings mounted on the brackets 18 above the shaft 22, and said shaft 24 is also provided with a plurality of friction wheels 25, which are peripherally engaged with the friction wheels 23 of the shaft 22. The wheels 23 and 25 being disposed in pairs, one pair for receiving the sheets from each chamber of the bosh 2, so that the wheels of the pairs engage the upper and under surface of the sheets along their side edges when they are fed to the flux compartment of the tinning pot A.

A shaft hanger 26 is slidably mounted upon each rod 19, and the ends of another transverse shaft 27 are journaled in the lower portions of said hangers, while a further transverse shaft 28 is journaled in vertically adjustable bearings provided in the shaft hangers 26 above the shaft 27. Rollers or wheels 29 and 30, similar to the wheels or rollers 23 and 25 and similarly disposed, are relatively fixed upon the shafts 27 and 28.

A still further shaft hanger 31 is slidably mounted upon each pair of rods 19 adjacent the shaft hanger 26, and has a pair of superposed shafts 32 and 33 journaled therein similar to the provision of the shafts 27 and 28 in the hanger 26. The shafts 32 and 33 are, respectively, provided with friction wheels 34 and 35 disposed and related in a manner similar to that described with respect to the wheels 23 and 25.

The shafts 22, 27 and 32 are respectively provided with worm gears 36, 37 and 38, which mesh with worms 36ª, 37ª and 38ª, respectively, which are slidably mounted on a squared portion 39 of the shaft 11. It will thus be seen that as the shaft 11 is rotated the rolls or wheels on the shafts 22, 27 and 32 will be rotated. It is also to be understood that the rolls or wheels 23 and 25, 29 and 30, and 34 and 35 are so related as to permit the passage of plates therebetween with incident friction sufficient to feed the plates at a uniform speed, which friction may be regulated by the adjustment of the shafts 24, 28 and 33 toward or away from the shafts 22, 27 and 32.

Extensible frames or intermediate hangers are provided for the shafts of the feeding mechanism, which include lower frames each composed of a pair of longitudinally slotted members or plates 40 and 41 slidably connected by a guide head 42, and having collars 43 and 44, respectively, integral with the members 40 and 41, with which collars 41ª slidable on shafts 22 and 32 are adapted to engage.

As shown in Figures 5 and 6 the shaft 27 is journaled in the sliding guide head 42 in each lower frame, while the shafts 22 and 32 are removably journaled in the ends of the slotted members 40 and 41. Similarly each upper frame comprises a pair of longitudinally slotted plates or members 45 and 46 slidably connected by a guide head 47 similar to the members 40—41. The shaft 28 being journaled in the guide head 47 and the shafts 24 and 33 being journaled in the members 45 and 46, respectively. The free ends of the members or plates 40—41 and 45—46 are curved downwardly to provide guides 48 and 49 which are adapted to lead or guide the plates from the wheels or pinch rolls 23 and 25 to the pinch rolls 8ª and to lead the plates between the pinch rolls 34 and 35 from the elevating means, to be described, and which is provided in each compartment of the bosh 2.

Lazy tongs 50 extend beside the brackets 18 and shaft hangers 26 and 31, and are connected to them so that when the shaft hanger 31 is pulled away from the bracket 18, a similar separating movement between the bracket 18 and the shaft hanger 26 is obtained so as to keep the spaces between these elements as nearly equal as possible, the necessity for which will be apparent.

The movement of the shaft hanger 31 away from the bracket 18 is accomplished preferably by means of a weight 51 suspended upon one end of a flexible member 52 which passes around a pulley 53 fixed to the right hand end of one of the rods 19, and which is connected as at 54 to the arm 55 of the shaft hanger 31. A suitable hoisting mechanism generally denoted as 56 may be provided for raising the weight 51 so as to permit retraction of the parts to their normal starting position as shown in Figure 1. This movement of the shaft hangers is provided so as to cause the elevating mech-

anism of each bosh compartment to always maintain engagement with the plates 3.

The elevating mechanisms each comprise carriages 57 movable transversely of the bosh compartment and engageable by a depending abutment or arm 58 for imparting movement to the carriages 57 as allowed by the successive removal of the plates 3 and as influenced by the weight 51 and its connection with the shaft hanger 31. The carriages 57 are mounted for movement transversely of the bosh 2, two of said carriages being disposed upon the upper edges of the end walls of said bosh, and the others being similarly disposed upon the upper edges of the partitions 4, anti-friction rollers 59 being provided on the carriages for riding upon the upper edges of the end walls and the partitions of the bosh 2 so as to insure free movement under the action of the weight 51.

Each carriage embodies an upper sheet metal frame 60 of substantially C-shape in top plan, as seen in Figure 4 with the ends of the frame disposed in slightly spaced relation to provide a slot 61 through which the edges of the plates 3 move when being elevated, and by means of which the plates are directed between suitable friction or pinch rollers 62 and 63 secured at intervals on the transverse shafts 64 and 65, respectively, which are journaled in the extensions or arms 58 of the shaft hangers 31 forwardly of the shaft 32, said shafts 64 and 65 being arranged in the same horizontal plane and side by side, while the shaft 65 is adjustable to and from the shaft 64 so as to permit obtaining of the proper relation between the friction or pinch rollers 62 and 63. These rollers 62 and 63 are disposed upon the shafts 64 and 65 in substantially the same relation as hereinafter described with respect to the rollers 23 and 25.

Each sheet feeding or elevating mechanism is composed of a pair of the carriages 57, and adjacent pairs of said carriages may be integrally formed or rigidly connected as seen in Figure 3. The pairs of carriages for each compartment of the bosh 2 supports a depending frame composed of a pair of side plates 66 rigidly connected in spaced relation in any suitable manner and provided with a transverse connecting plate 67, around which a pair of endless chains 68 pass, said chains being arranged one adjacent each plate 66 and each engaging a sprocket wheel 69 at the lower ends of the plates and a similar sprocket wheel 70 at the upper ends thereof, a shaft 66^a being rotatably mounted in the lower ends of the plates 66 and having the sprockets 69 fixed thereon, and a similar shaft 66^b being rotatably mounted in the upper members of the carriages 57 with the sprockets 70 secured thereon. The chains 68 are connected by a transverse friction member or pad 71 which is disposed so as to engage the outer plates of the piles of plates when said friction members 71 are moved in an orbital path by traveling with the chains 68.

The shaft 64 is preferably driven from the shaft 32 by means of a train of spur gears 72, and this rotation of shaft 64 is transmitted to the shaft 66^b, which carries the sprockets 70 by means of a chain 73 which may be passed around the desired alined ones of the sprocket wheels 74 upon the latter shaft and the sprocket wheels 75 upon the shaft 64. As shown, the sprocket wheels 74 gradually decrease in size from left to right, while the sprocket wheels 75 increase in size in the same direction so that by changing the chain 73 to different pairs of these sprockets, the chain 68 of the sheet elevating means may be driven at different speeds according to the nature of the work. It will be noted that the chain 73 may be removed and when this is done the overhead feeding means may be elevated by reason of the provision of a hinge 76 in the shaft 11 and the break joint 77 in the shaft 13. When the overhead feeding mechanism is elevated or raised the bosh 2 may be removed and another filled bosh substituted therefor.

It will also be noted that when the abutment or depending arm 58 engages the adjacent carriage 57, the slots 61 of the carriages are vertically alined with the bite of the friction wheels or pinch rollers 62—63 so as to insure passage of the sheets, without interference, from the elevating means to the overhead feeding means. The connecting plates 67 of the elevating means furnish a solid backing for the endless members of said elevating means so as to cause firm engagement of the pads 71 with the faces of the outer plate of the piles or packs of plates 3 when the carriages 57 are forced toward the plates.

From the foregoing it will be noted that as the piles of plates diminish the carriages 57 move transversly of the bosh 2 in a direction away from the tinning pot, so that the pads 71 are maintained in contact with the outermost plates, and when this movement occurs the shafts 27 and 32 move relative to the shaft 22 and relative to each other away from the tinning pot, and the lazy tongs 50 equalize this relative movement so as to maintain substantially the same space between the shafts 24 and 28 as between the shafts 28 and 33.

As shown clearly in Figure 4 the brackets 18 are connected by a transverse bar 79, while the shaft hangers 31 are connected by a similar bar 80 so that rigidity is insured and any movements of these parts must be in unison.

As shown clearly in Figures 1, 9 and 10

the brackets 18 are provided with bearings 81 and 82 in which shafts 83 and 84, respectively, are journaled. The shaft 84 is adjustable toward and from the shaft 83. The shafts 83 and 84 are arranged between the shafts 16 and 22 directly above the flux box 6 and have suitable friction or pinch rollers 85 secured thereon in the same relation as has been described with respect to the rollers 27, etc. The shaft 83 is driven by the shaft 22 through a train of spur gears 86 whereby rotation of the rollers 85 is had, and intermeshing gears or pinions 87 are provided between the shafts 83—84 and between shafts 22—24, 27—28 and 32—33, whereby rotation of one of said shafts insures rotation of the other opposed thereto. In other words, each of the shafts 22, 27 and 32 are driven by the power shaft 11 and the rotation thereof is communicated to shafts 24, 28 and 33 by means of spur gear connections 87, while the shaft 83 is driven from the shaft 22 by the gear train 86 and the rotation thereof is communicated to the shaft 84 by the spur gear connection 87 between said shafts.

Referring to the detail drawings of the pad 71 of the elevating mechanism, as shown in Figures 15 and 16, it will be seen that the pad 71 is provided with bolts 90 for reception of nuts 91 whereby said pads are secured to the chains 68.

It will be noted that intermeshing gearing 94 is provided between the shafts 64 and 65, as shown clearly in Figure 4, for insuring driving of these shafts in unison.

The slots 61 are adapted to be varied in size so as to accommodate plates of varying thicknesses, and at the same time insure the passage of only a single plate by means of an adjustable plate or stop 95 for each slot, which is slidably mounted for adjustment on the carriage 57. Each of the stops or plates 95 are provided with a screw threaded sleeve 97 for the reception of a screw 98 adapted to be rotated to adjust the plate 95 to vary the slot 61.

In operation, the plates are passed upwardly from the packs or piles singly and successively to and between the rollers 59, 59, by means of the elevating devices which include the pads 71. After a sheet or plate passes the rollers 62 and 63, it is deflected by the guides 49 between the rollers 34 and 35 of the overhead feeding mechanism to and between the rollers 29—30 of the latter and then to and between the rollers 23—25 from whence it is deflected downwardly by the guides 48 so as to pass between the rollers 85, 85, and through the guides 8 in the flux box.

I claim:—

1. In a tin plate feeding apparatus including a bosh, and means for holding a pile of plates in a vertically disposed pack within said bosh, means for feeding said plates singly, vertically out of said bosh, said means comprising a carriage movable transversely of said bosh, friction means supported by said carriage adapted to engage and elevate said plates, means for exerting a constant pull on said carriage so as to force said friction means against the outermost of said plates, a slot formed in said movable carriage through which said plates pass when being elevated by said friction means, and means for adjusting the width of said slot so as to prevent more than one plate passing through said slot at a time.

2. In a tin plate feeding apparatus including a bosh, and means for holding a pile of plates in a vertically disposed pack within said bosh, means for feeding said plates single, vertically out of said bosh, said means comprising a carriage movable transversely of said bosh, friction means supported by said carriage adapted to engage and elevate said plates, means for exerting a constant pull on said carriage so as to force said friction means against the outermost of said plates, a slot formed in said movable carriage through which said plates pass when being elevated by said friction means, a movable stop plate adapted to be moved into said slot to vary the width thereof, to prevent more than one plate passing through said slot at a time, and screw threaded means for moving and locking said stop plate in its various positions.

In testimony whereof, I have hereunto signed my name.

DARIO BUCCICONE