

Dec. 6, 1955

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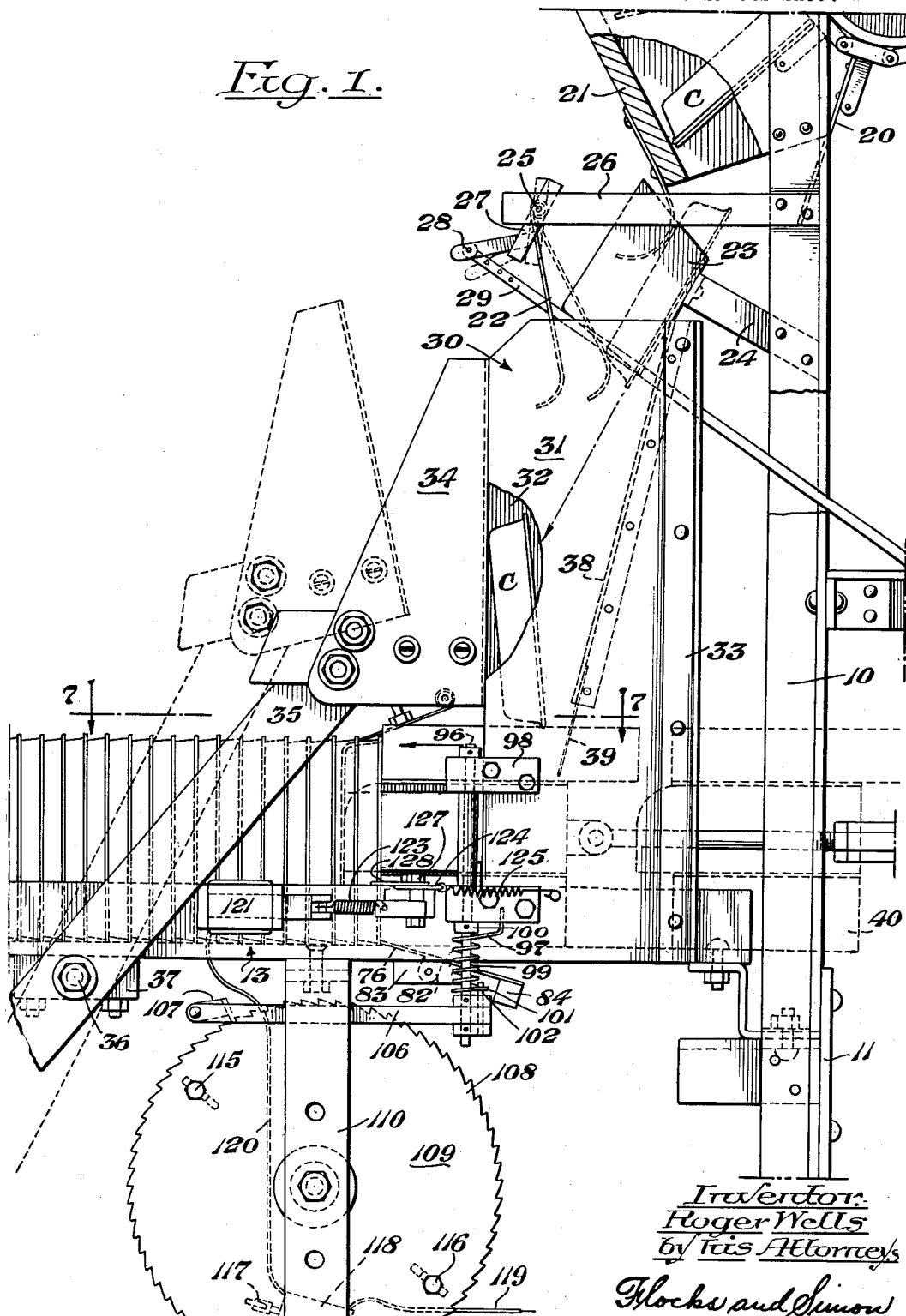
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CONTAINER STACKING MACHINE

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7 Sheets-Sheet 1

Fig. 1.



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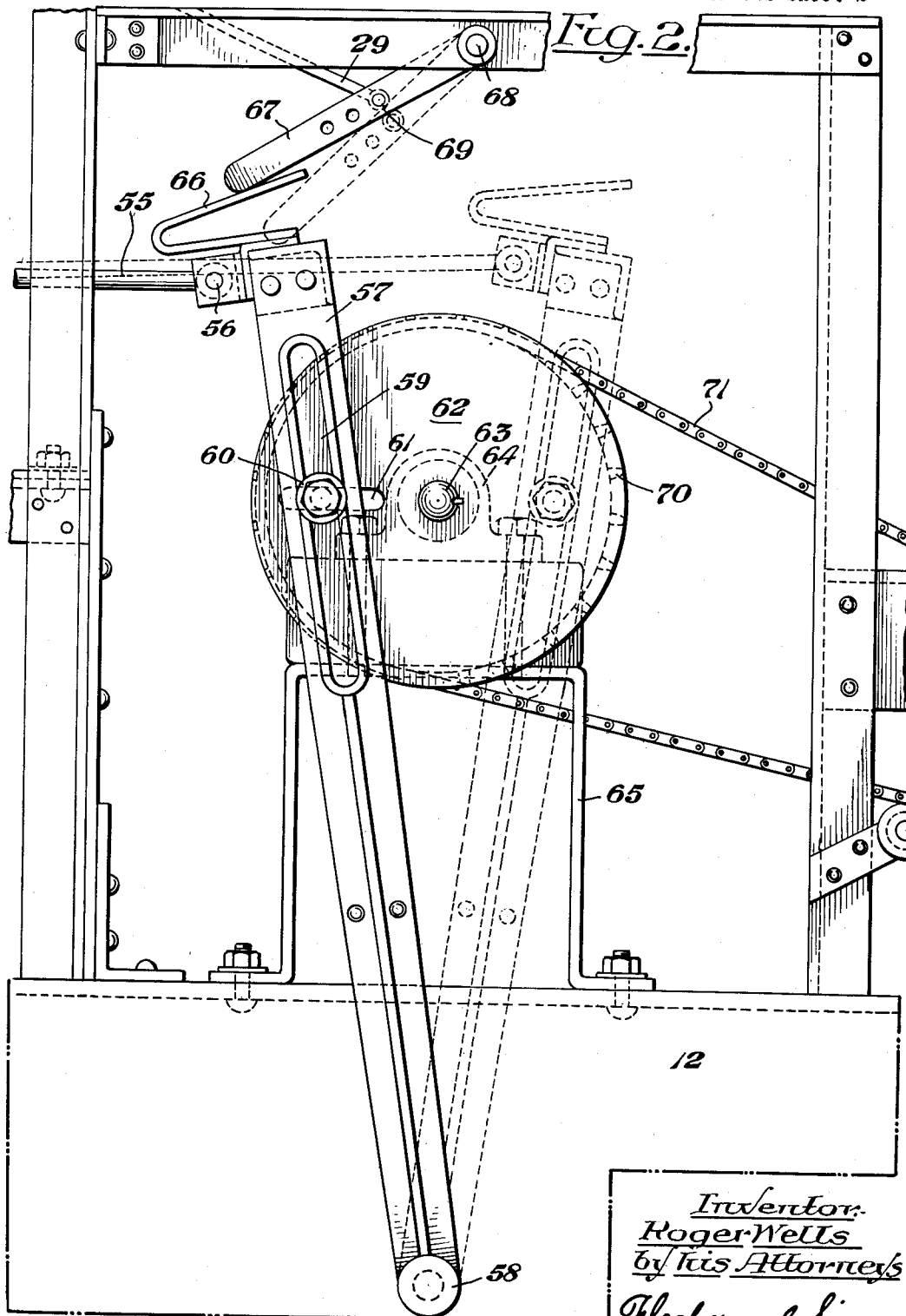
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Fig. 3.

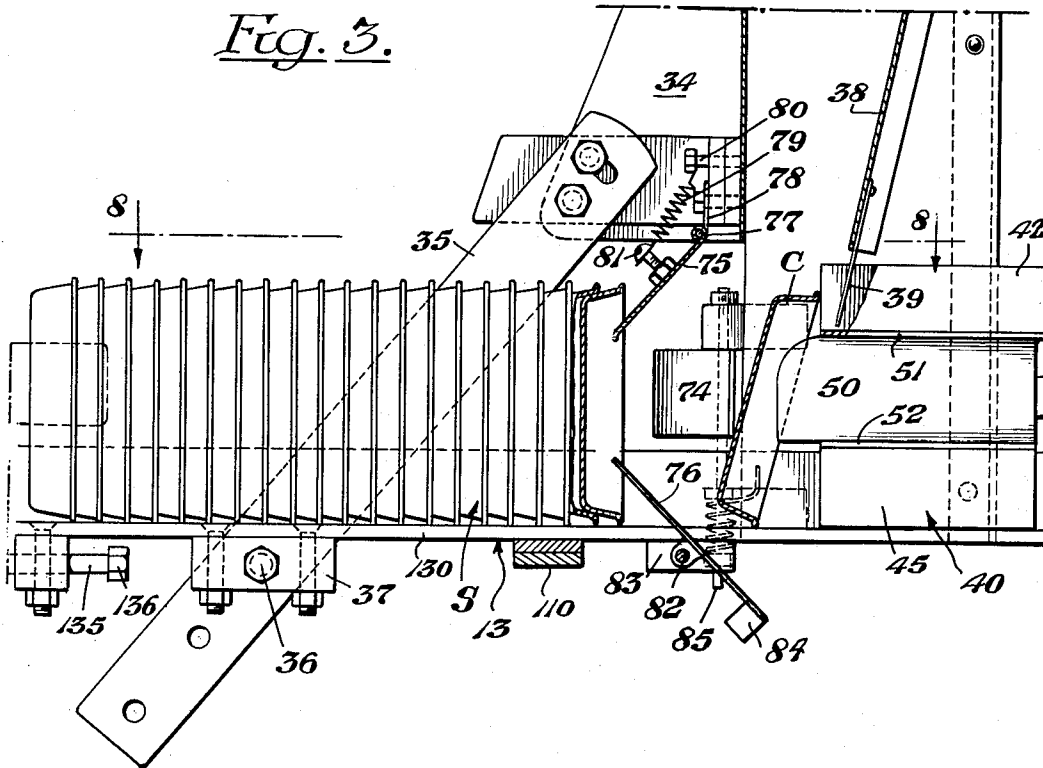
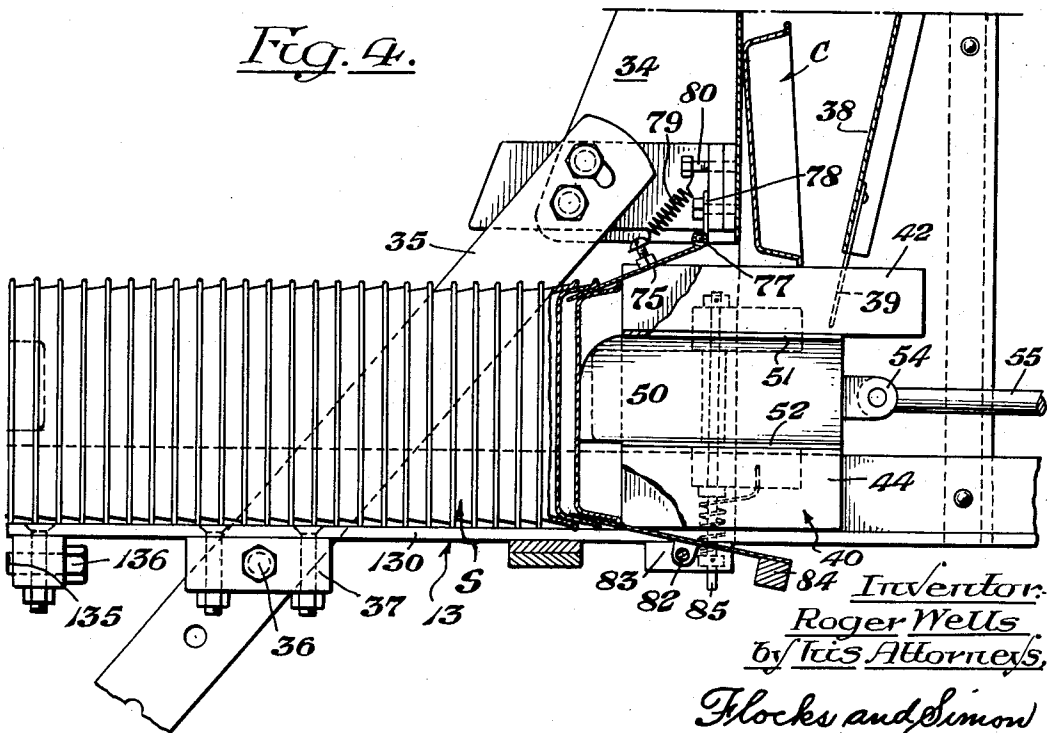


Fig. 4.



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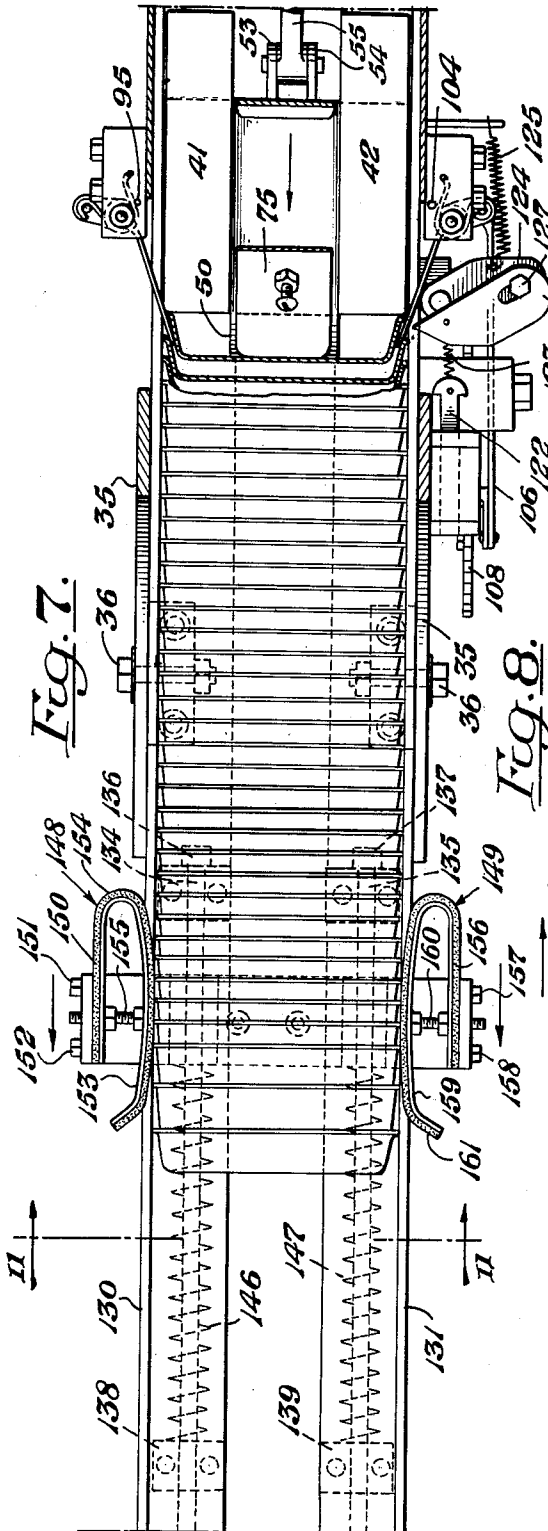
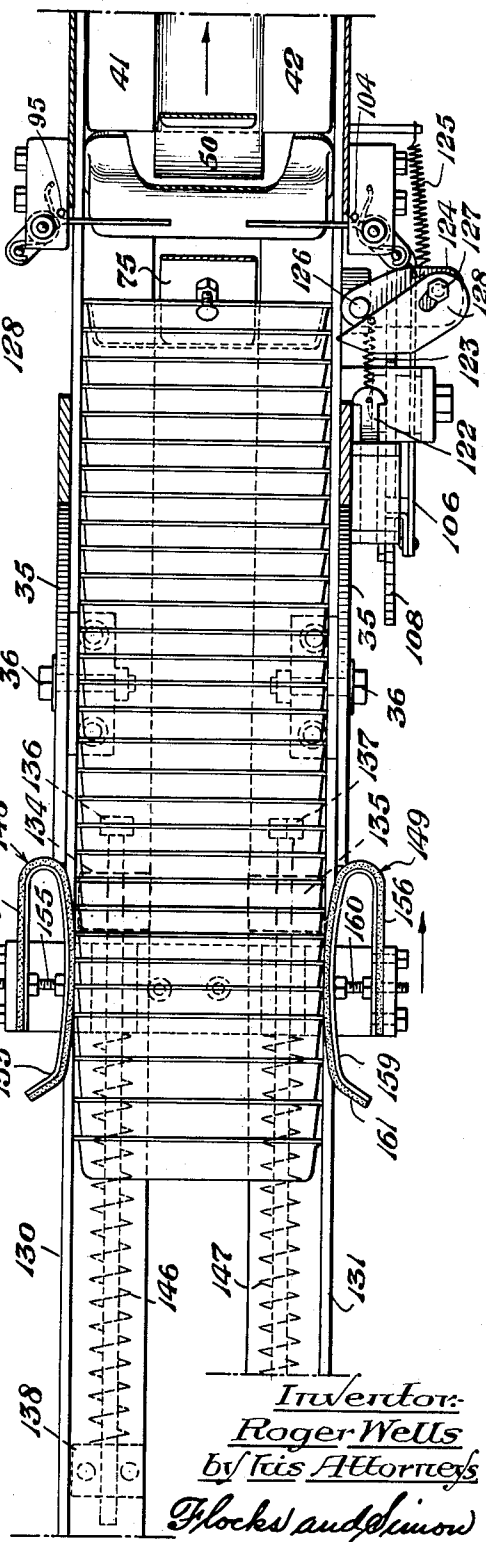
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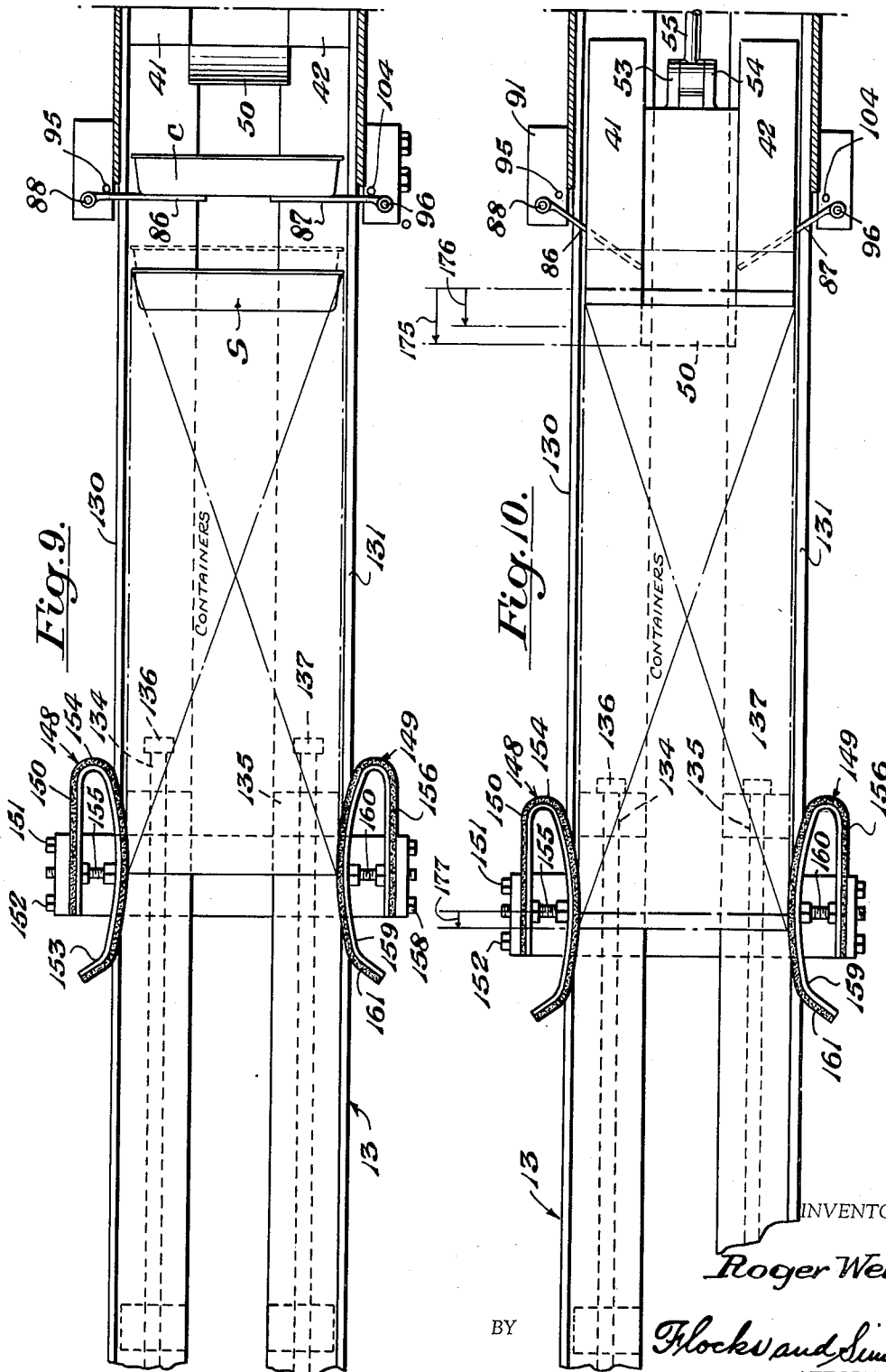
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Fig. 14.

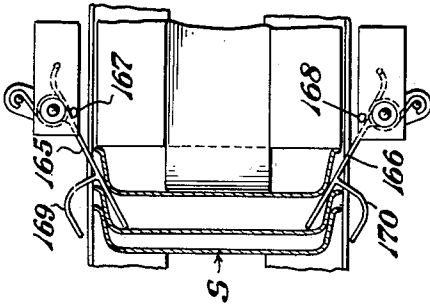


Fig. 15.

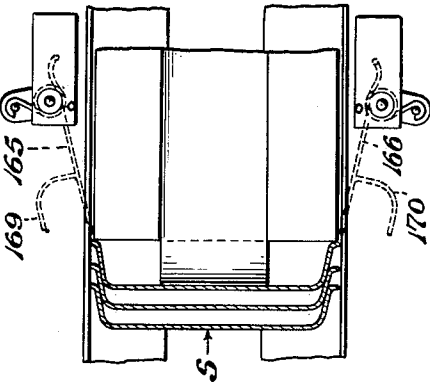


Fig. 11.

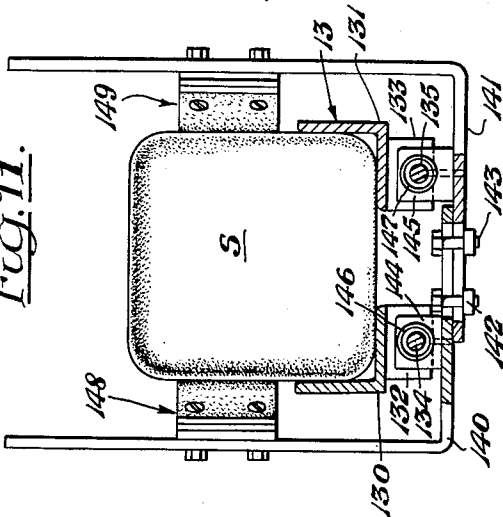
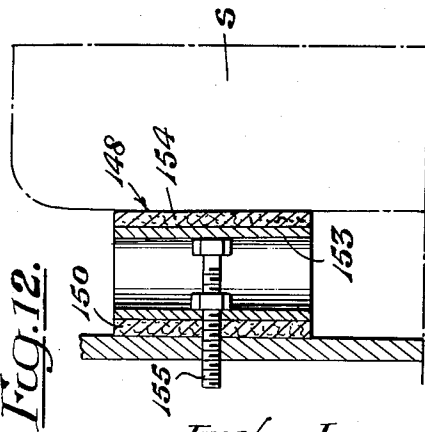
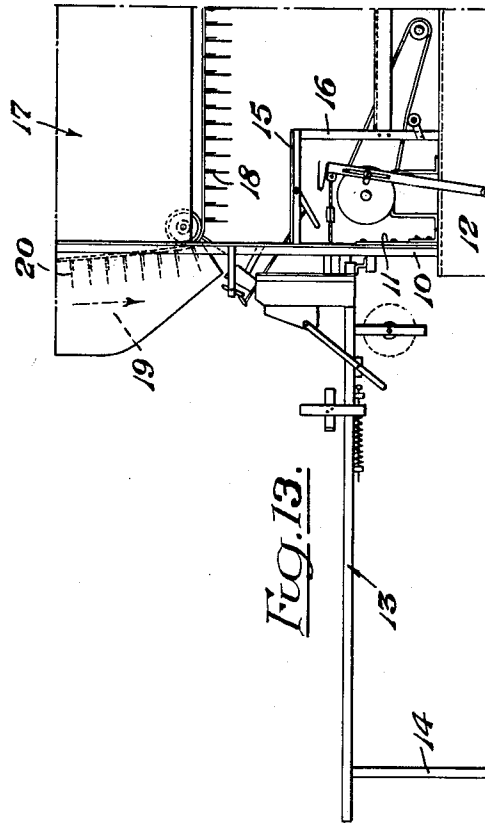


Fig. 12.



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2,725,992

CONTAINER STACKING MACHINE

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Application August 9, 1950, Serial No. 178,509

14 Claims. (Cl. 214—7)

The present invention relates to a plate stacking and counting device. More particularly the present invention relates to a device for the arrangement of plates of stiff paper or molded pulp in nested relation and for the counting of the nested plates.

It is one of the general objects of the present invention, therefore, to provide a novel device for receiving the plates from a drier wherein the plates, after molding, are continuously dried, and thereafter automatically arranging the plates in nested relation in a stack for convenient access by an operator.

A second general object of the present invention is to provide a device for successively moving single plates into nested relation with a plurality of other plates, said device being provided with means for marking one of said plates at given intervals.

A third general object of the present invention is to provide means to produce a column of nested plates and guide means cooperating with reciprocating means for moving and guiding additional plates into proper relation to the remaining plates in the column.

A fourth object of the present invention is to provide novel reciprocating means for moving plates into relation with plates in a column, together with guide means for guiding said plates and for counting said plates, the aforesaid reciprocating means being constructed so that movement of the reciprocating means in the absence of a plate will not actuate said guide and/or counting means.

A fifth object of the present invention is to provide yielding means for resisting movement of a column of nested plates, while permitting limited movement of said column therethrough.

Other objects and advantages of the present invention will become apparent from the subsequent description and figures of the drawing wherein:

Fig. 1 is a side elevation partly in section of the device according to the present invention, showing a plunger feed means in partially advanced position with a plate or food container resting thereon;

Fig. 2 is a side elevation of the operating mechanism for actuating the feed plunger;

Fig. 3 is a view similar to Fig. 1, partly in section, with the plunger in retracted position;

Fig. 4 is a view similar to Fig. 3 with the plunger approaching fully advanced position;

Fig. 5 is a view similar to Fig. 4 with the plunger in fully advanced position and showing the upper and lower guide doors in the position occupied prior to movement of the plunger to retracted position;

Fig. 6 is a perspective view of the plunger and lateral guide doors with the plunger in retracted position;

Fig. 7 is a section taken along the line 7—7 of Fig. 1;

Fig. 8 is a section taken along the line 8—8 of Fig. 3;

Fig. 9 is a section similar to Figs. 7 and 8 with the plunger in fully retracted position;

Fig. 10 is a similar section with the plunger in fully advanced position;

Fig. 11 is a vertical section taken generally along the

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line 11—11 of Fig. 7, showing the shoes on the yieldable retarding mechanism in engagement with a plate edge;

Fig. 12 is a detail section of one of the brake shoes;

Fig. 13 is a diagrammatic view of the machine showing the relationship of the assembly track and driving mechanism;

Figs. 14 and 15 are plan views, partly in section, of a portion of the machine showing modified lateral door guides.

Referring to the figures of the drawings and particularly Figs. 1 and 13 thereof, the device of the present invention includes a main supporting structure consisting in part of vertical angle irons 10 fastened together towards their lower end as by tie plates 11 fastened to and supported by a base member 12. Extending from the angles 10 is a delivery trough or track indicated in general at 13, fastened at one end to the angle bars 10 and supported at its other end by a leg structure indicated at 14. Extending from the angle bars 10 in opposed relation to the delivery trough 13 is a horizontal bar 15 supported at its end remote from the angles 10 by a vertical supporting member 16 fastened to the base member 12 at its lower end.

The drier indicated in general at 17, which serves to receive moist plates from a pulp molding machine (not shown), is positioned above the device of the present invention and is also supported at its forward end by the angle bars 10. Movable through the drier 17 is a suitable conveyor chain indicated at 18, the direction of movement of the conveyor chain being shown by the arrow 19 in Fig. 13. The chain 18 is subject to intermittent movement and is provided with a series of partitions 20 for supporting plates or containers C. These plates or containers are fed into a guide chute 21 at the lower forward end of the drying mechanism as the partitions 20 approach an inclined generally vertical position and as delivered are arrested in their movement by a swingable stop member 22 which is movable between the two positions indicated in Fig. 1. The stop member 22 serves to retain the plates in position on a guide member 23 supported as by the bar 24 from the vertical angles 10. The stop member 22 is pivoted as at 25 from the bar 26 also supported by the vertical angle 10. The stop member 22 moves with a lever 27, in turn moved by a lever 28 pivotally connected to an actuating rod 29. A second vertically disposed guide chute 30 is provided positioned to receive the containers C as they are released by the stop member 22. The guide chute 30 is formed from a pair of lateral vertically disposed plates 31 and 32 in part supported as by a vertically extending angle 33 extending vertically upward from the track or trough 13. The forward end of the chute 30 is closed as by a member 34 pivotally supported by the arm 35 pivoted on the bolt 36 which is in turn journaled in the cross-member 37 for the track 13. The rear end of the guide chute 30 is closed by an inclined back member 38. The lower end of the back 38 is provided with a spring guide 39 which prevents the rearward movement of the plates or containers C with a reciprocating plunger 40 which arrests the downward movement of the plates C upon their reaching the guide chute 30. It will be noted in this connection that the plunger 40, which reciprocates, as will be hereinafter pointed out, is timed in its movement so as to be in forward position when the plate C is released by the stop member 22.

Referring now in particular to Fig. 1, it will be noted that the plunger is moving forward and has not yet reached its full forward position but the plate C is resting upon the plunger 40 or more particularly upon a pair of horizontal bars 41 and 42 forming the upper part of the plunger 40, as shown in detail in Fig. 6. In Fig. 5 the plunger 40 is in fully forward position and the con-

tainer is resting upon the rear end of the bars 41 and 42. As best shown in Fig. 6 the plunger 40 is of a special construction so as to contact the four corners of a plate or container and thus includes a central core member 43, the two upper bars 41 and 42 just referred to and two lower bars 44 and 45, all of the bars extending outwardly beyond the core member 43 and thus forming four slots or grooves, the two grooves in alignment with the vertical axis of the core 43 being indicated at 46 and 47, respectively, and the two grooves in alignment with the horizontal axis of the core 43 being indicated at 48 and 49. This particular structure enables the plunger, in engaging the containers or plates, to exert an even pressure thereon while still providing the grooves for receiving guide doors as will be hereinafter set forth. It will be noted that the core 43 extends forwardly and is provided with a nose 50 which engages the inside of the containers or plates. The bars 41 and 42 are supported on a plate 51 fastened to the core member 43 and the bars 44 and 45 are supported and fastened to a plate 52 fastened to the core member 50. The rear end of the core member 43 of the plunger 40 is provided with a pair of ears 53 and 54 having journalled therebetween the end of a piston rod 55. The end of the piston rod 55 remote from the plunger (Fig. 2) is pivotally connected as at 56 to an arm 57 which in turn is pivoted at 58 on the base member 12. Intermediate its ends, the arm 57 is provided with a slot 59 which receives a pin 60 extending through a slot 61 in a disc 62. By varying the position of the pin 60 with respect to the slot 61, the length of the stroke of the reciprocating plunger can be varied. The disc 62 is supported for rotation with a shaft 63 by a bearing 64 supported by the bracket 65 from the base member 12. Rotation of the disc 62 and consequent movement of the pin 60 within the slot 61 and the slot 59 will, therefore, reciprocate the piston or plunger rod 55. At the upper end of the arm 57 there is also provided a cam member 66 which cooperates with a pivoted lever 67 pivotally supported as at 68 from the member 13 previously described. The lever 67 is pivotally connected as at 69 to the actuating rod 29 previously described so that movement of the arm 57 will also rotate the stop member 22 previously described. The disc 62 is rotated by the shaft 63 which is in turn rotated by a sprocket 70 driven by the roller chain 71 which is in turn driven in synchronism with the drier chain 18 so that movement of the drier chain to deliver a container or plate will simultaneously operate the remainder of the mechanism in proper timed relation.

Referring in particular to Fig. 3, it will be noted that a pair of vertical guide doors 75 and 76 are provided for guiding a container C into proper nested relation. The guide door 75 is pivoted at 77 to a bracket 78 suitably supported from the member 34. The guide door 75 is balanced to normally assume the position shown in Fig. 3 by a spring 79 fastened at one end to a bolt 80 and at the other to an adjustment screw 81 on the door 75. The door 76 is pivoted at 82 to a cross-member 83 and is counter-balanced to assume the position of Fig. 3 by a weight 84, the downward movement of the weight 84 being limited by a stop 85 extending from the member 83.

As shown in Fig. 4 the forward movement of the piston 40 has moved the container C forwardly, pushing the guide doors 75 and 76 into the position shown. Further movement of the piston member into the position of Fig. 5 will move the container C and the entire stack of containers S away from the guide doors 75 and 76 but the doors are prevented from returning to the position of Fig. 3 by their entry into the grooves 46 and 47.

Referring in particular to Fig. 6, it will be noted that a pair of lateral or horizontal guide doors 86 and 87 are also provided, which serve to guide a container into stacking relation in cooperation with the guide doors 75 and 76, just described, and the piston 40. The lateral guide door 86 is mounted to rotate with the pivot pin 88 suitably journalled and supported at its upper and lower ends

for rotation. Wound about the lower end of the pivot pin 88 is a spring 89 having an end 90 fixed in a bearing block 91 and a lower end 92 which cooperates with a pin 93 on an arm 94 movable with the pivot pin 88. The spring 89, therefore, urges the door 86 into the position shown in Fig. 8 wherein a stop 95 extending upwardly from the block 91 arrests further movement in a rearward direction.

The door 87 is similarly pivotable with a pivot pin 96 journalled in the lower block 97 and an upper block 98 (Fig. 1). A spring 99 is wound about the lower end of the pin 96 and is provided with an upper end 100 fixed in the block 97. The lower end 101 of the spring 99 cooperates with a pin 102 on an arm 103 rotatable with the pivot pin 96. The spring 99 therefore urges the door 87 into engagement with the stop 104, as shown in Fig. 8. The arm 103 forms part of a yoke including the arm 105 at its lower end and journalled in the yoke thus formed is a counting arm 106 provided with a pawl member 107 at its other end. As shown in Fig. 1, the pawl 107 normally engages the ratchet tooth 108 on a counting wheel 109 which is supported for rotation as on a hanger 110 extending downwardly from the track 13.

The door 87, therefore, functions not only as a guide door for the containers but also as a counting door. Movement of the door 87 from the position shown in Figs. 8 and 9 to the position of Fig. 7 will move the pawl 107 a sufficient distance to operate the ratchet wheel 109 a distance of one tooth. In the absence of a container, however, the movement of the door 87 to the position of Fig. 10, which is the maximum movement caused by the piston alone, will not move the pawl 107 sufficiently to move the ratchet wheel 109, since the door 87 enters into the groove 48 and assumes only a slight inclination from its original position.

The doors 86 and 87 also serve to maintain a container in substantially vertical position after it has dropped in front of the piston 40 upon rearward movement of the piston, the spring guide 39 cooperating with the doors to confine a container therebetween. The counting wheel 109 is provided with a pair of lugs 115 and 116 extending from the face thereof and dividing the counting wheel into two equal segments. The lugs 115 and 116 periodically contact an actuating portion 117 on a microswitch 118 suitably supported from the hanger 110. The microswitch 118 is connected to a potential source, as by the wire 119, and supplies current when actuated by means of a wire 120 to a solenoid 121 supported laterally adjacent the track 13. The solenoid 121 is provided with an armature 122 which is in turn connected as by a spring 123 to a knife actuating arm 124. The arm 124 is normally retained in the position shown in Figs. 7 and 8 by a spring 125. The arm 124 is suitably pivoted and supported at 126 adjacent the guide track 13. Movement of the core 122 will, therefore, through the spring 123, cause the arm 124 to swing in a clockwise direction about the pivot 126 in opposition to the action of the spring 125. At the free end of the arm 124 there is pivoted, as by an adjacent bolt 127, a marking knife 128. Movement of the arm 124 will therefore cause the knife 128 to move inwardly and lightly nick the edge or rim of a selected plate or container, this action taking place twice during a complete rotation of the counting wheel 109.

Referring in particular to Figs. 11 and 12, it is to be noted that the track 13 is constituted by a pair of angles 130 and 131 so as to form a guide for the containers. At a point along the track, suitably spaced from the guide chute 30, there is provided a pair of bearing blocks 132 and 133 extending downwardly and supported by the angles 130 and 131. Journalled through the bearing blocks 132 and 133 are a pair of bolts 134 and 135 which extend in general parallelism with the respective angle members 130 and 131. The bolts 134 and 135 are provided with heads 136 and 137 which limit their movement within the bearing blocks 132 and 133 and are further

supported at a point remote from their heads by a second pair of bearing blocks 138 and 139 similarly supported from and extending downwardly from the angles 130 and 131. Mounted on the bolts 134 and 135 for movement therewith is a U-shaped bracket formed from the two L-shaped members 140 and 141 held together by the bolts 142 and 143. Bearing against the upwardly extending ears 144 and 145 of the U-shaped bracket member are a pair of springs 146 and 147, respectively, these springs being coiled about the bolts 134 and 135. The other end of the springs 146 and 147, respectively, bear against the blocks 138 and 139 and the springs normally urge the ears 144 and 145 and the bracket to the right, as shown for example in Figs. 7 to 10, inclusive. Movement of the U-shaped bracket, however, to the right under the action of the spring is limited by contact of the ears 144 and 145 with the bearing blocks 132 and 133. Similarly, movement of the U-shaped bracket to the left is limited by contact of the heads 136 and 137 with the other side of the bearing blocks 132 and 133. Carried by the U-shaped bracket for movement therewith are a pair of brake shoes 148 and 149. The brake shoe 148 includes a portion 150 which is fastened to the L-shaped member 140 by the screws 151 and 152. The other portion 153 of the brake shoe 148 extends in general parallelism with the track angle member 130. The brake shoe 148 is provided with a friction facing of a suitable material such as leather, indicated at 154, and the entire brake shoe is formed of a spring metal, such as spring steel. Adjustment of the portion 153 of the brake shoe relative to the portion 150 is achieved by means of the adjustment bolt 155 so that the friction face 154 of the brake shoe 148 may be brought into firmer contact with the containers moving along the track 13. In general the bolt 155 is adjusted so that ordinarily the friction facing 154 firmly engages the edges of the stacked containers and not only moves with the stack under the action of the piston member 40 but also exerts sufficient pressure as to be capable of moving the entire stack to the right when the piston 40 is in retracted position. The brake shoe 149 is of similar construction and includes a portion 156 fastened to the L-shaped member 140 by screws 157 and 158 and a second portion 159 adjacent the track angle 131. The brake shoe 149 is also provided with an adjustment bolt 160 and a friction facing 161.

Referring to Figs. 14 and 15, there is shown a modified form of lateral or horizontal door structure, these modified doors being indicated at 165 and 166, respectively. The operation of these horizontal door members is identical to that described in connection with the members 86 and 87, respectively, except that the members 165 and 166 at their innermost position are in contact with stop members 167 and 168 so that their furthest inward movement is that corresponding to the position shown in Fig. 14. The doors 165 and 166 in this modified form are provided with outwardly extending lugs 169 and 170, respectively, which form pockets for receiving and arresting the stack of plates upon their rearward movement as the piston 40 is withdrawn, this position being shown in Fig. 14.

Operation

Referring to the figures of the drawings and particularly Figs. 1 and 7, it will be noted that the plunger or piston 40 is there shown in partially advanced position. Just prior to this position of the plunger the stop member 22 has been rotated to its full-line position so as to release the plate C and permit it to descend onto the top of the plunger 40, as shown in Fig. 1. Thereafter the plunger 40 moves forwardly through the position shown in Fig. 4 where a plate previously fed is being nested with the remainder of the nested or stacked plates to the fully advanced position of Fig. 10 and Fig. 5. It will be noted that this position of the plunger corresponds to the position shown in Fig. 2 of the disc 62. It will be noted that

in this position the slot 61 is in alignment with a horizontal axis drawn through the disc 62 and that the cam 66 has already actuated the lever 67 which in turn has moved the actuating rod 29 to rotate the lever 27 and the stop member 22, thus releasing the container C. The plunger or piston rod 55 is also in its extreme forward position. Furthermore rotation of the disc 62 will, therefore, move the plunger rod 55 to the right, as shown in the drawings, and also move the cam 66 to the right which will move the stop member 22 into container arresting position so that when the next container is discharged from the chain and the partitions 20 it will be arrested at the top of the guide chute 30.

Movement of the piston or plunger 40 to retracted position will allow the entire stack of nested containers to move to the right from the position of Fig. 10 and Fig. 5 under the action of the springs 146 and 147 which tend to move the brake shoes 148 and 149 to retracted position. This movement of the entire stack will continue until the ears 144 and 145 contact the bearing blocks 132 and 133. Thereafter the piston will continue its rearward movement but the stack of nested plates will remain in the position shown, for example, in Fig. 8 and in Fig. 3, the friction and tension of the rims of the plates tending to hold the nested column together. In the modification of the device shown in Figs. 14 and 15, however, the rearward movement will be arrested by the pockets formed between the main portion of the guides 165 and 166 and the portions 169 and 170, this particular modification being especially desirable where shallow containers or plates are being processed, which may have a tendency to move out of nested relation.

During the rearward movement of the plunger 40 the container C resting on the top of the plunger has no tendency to move backward with the plunger due to the action of the spring finger 39, and as soon as the plunger has moved rearwardly a sufficient amount the container C drops down in front of the plunger, as shown in Fig. 3. Thereafter, as the plunger moves forward the center or inside of the container is contacted by the nose 50 and the four corners of the container are contacted by the bars 41, 42, 44 and 45. A uniform pressure is thus exerted upon the container and it is moved forwardly through the vertical guide doors 75 and 76 and the horizontal or lateral guide doors 86 and 87. The guide door 87 is rotated sufficiently by the container during this operation so that the pawl 107 moves the ratchet or counting wheel 109 a distance corresponding to one tooth thereon. The guide doors during this operation serve to guide the container into nested relation with the column of containers, as shown, for example, in Fig. 4 and Fig. 7, and after the container is nested with the remainder of the column the entire column is moved forwardly carrying with the column the brake shoes 148 and 149 until the heads 136 and 137 are in contact with the bearing blocks 132 and 133. Prior to and during this forward movement the brake shoes act to retard the forward movement of the plates or containers in direct contact therewith and ensure the firm nesting of the new container being added with the remaining plates in the column. When the heads 136 and 137 are in contact with the bearing blocks 132 and 133 the forward movement of the brake shoes 148 and 149 is arrested but the column of nested plates is not thus arrested since the column is capable of being forced through the shoes 148 and 149 under the action of the plunger 40. This additional movement is precisely equivalent to the space occupied by one plate or container. The action of the column of containers, plunger or piston 40 and brake shoes is diagrammatically illustrated in Fig. 10 wherein the entire stroke of the piston after contacting a container is indicated by the arrow 175, the gate or guide door movement by the arrow 176 and the stack or column slippage through the brake shoes by the arrow 177.

It will be noted that each time the guide door 87 is

moved forward by a container the pawl 107 moves the counting wheel 109 one tooth, no movement taking place if no container is present since the guide door 87 is incapable of sufficient movement in the absence of a container. If, for example, it is desired to count 84 containers the ratchet wheel or counting wheel will then have 168 teeth. When the 84th container is counted one of the lugs 115 or 116 will contact the actuating member 117 for the switch 118 and the solenoid 121 will then be energized to move its armature 122 to the left (Figs. 7 and 8) thus simultaneously moving the lever 124 and the knife 128 to make a small nick or mark in a container. It is to be understood, however, that other marking means may be used for this purpose, such as an ink brush or a marking pencil so that an attendant can easily see and separate a given number of containers from the column after the column has been moved through the brake shoes 148 and 149, it being understood that the track 13 is of sufficient length to store a plurality of counted groups of containers.

The mounting of the member 34 on the arm 35 enables the member 34 to be swung into a forward position as indicated in dotted lines (Fig. 1). This position exposes the interior of the guide chute 31 so that in the event more than one container or plate gets into the chute, or other trouble occurs, the chute can be manually cleared.

I claim:

1. A plate stacking device comprising, a track means for receiving and supporting a column of nested plates, means for moving said column of nested plates along said track means, engaging means adjacent said track means including a pair of opposed spring shoes for retarding the movement of said column along said track means, means for supporting said engaging means for movement along said track means with said column, spring means cooperating with said engaging means and opposing the movement of said engaging means along said track means, and means to limit the movement of said engaging means but not said column of nested plates whereby said column of nested plates is moved a greater distance than said engaging means.

2. A plate stacking device comprising reciprocating plunger means for moving successive plates into nested relationship to form a column of nested plates and thereafter advancing said column, said reciprocating plunger means including a pair of horizontal members forming the upper corners of said plunger means, said members being spaced apart to define an indentation in the top surface of said plunger means, means for feeding a plate onto the upper surface of said reciprocating plunger means, and fixed guide means extending into said indentation for retaining said plate from movement with said plunger means and for guiding said plate into stacking position in front of said plunger means upon the return stroke of said plunger means.

3. A device in accordance with claim 2 including additional means for guiding said plates into nested relationship with said column of nested plates, each forward stroke of said reciprocating plunger means moving the plate in front of said plunger means beyond said additional guide means, and means for returning said additional guide means to the original position.

4. A device in accordance with claim 3, wherein at least one of said additional guide means is so positioned that said indentation will receive said guide means when said plate has moved beyond said guide means.

5. A device in accordance with claim 3, including indentations in said plunger means, said indentations and said additional guide means being so positioned that said indentations will receive said additional guide means when said plate has moved beyond said additional guide means.

6. A plate stacking device comprising means for feeding successive plates to stacking position, reciprocating plunger means for moving successive plates into nested

relationship to form a column of nested plates and thereafter advancing said column, engaging means mounted on each side of said column for frictionally engaging at least a portion of said column between said opposed engaging means, means for supporting said engaging means for movement forwardly with said column during the forward stroke of said plunger means, a stop means for limiting the forward travel of said engaging means before the end of the forward stroke of said plunger means, whereby the final portion of said forward stroke advances said column with respect to said engaging means by one plate.

7. A device in accordance with claim 6, including spring means for returning said engaging means and said column of plates during the return stroke of said plunger means, and a second stop means for limiting the rearward travel of said engaging means and said column of plates before the end of the return stroke of said plunger means.

8. A device in accordance with claim 6, with means for guiding successive plates from stacking position into nesting relation with the column of plates, the forward movement of said reciprocating plunger means moving each plate beyond said guide means, said guide means returning to the original position.

9. A device in accordance with claim 8, with spring means for returning said engaging means and said column of plates during the return stroke of said plunger means, said guide means serving as a stop for limiting the rearward travel of said column of plates before the end of the return stroke of said plunger means.

10. A plate stacking device comprising a track means for receiving and supporting a column of nested plates, engaging means adjacent said track means on each side thereof for frictionally engaging at least some of the plates in the column, a stop means, spring means for retaining said engaging means adjacent to said stop means, reciprocating means for moving a plate into nested relation in said column and moving said column and said engaging means, thereby energizing said spring means, means to limit the movement of said engaging means prior to the conclusion of the forward stroke of said reciprocating means, whereby said column is advanced with respect to said engaging means.

11. A plate stacking device comprising reciprocating plunger means for moving successive plates into nested relationship to form a column of nested plates and thereafter advancing said column, means for feeding a plate in front of said reciprocating plunger means during each return stroke of said plunger means, said reciprocating plunger means having an indentation, said indentation being defined by a plurality of horizontal members forming corners of the plunger means, guide means for guiding each of said plates into nested relationship, the forward movement of said plunger means moving said plate beyond said guide means, said indentation in said plunger means and guide means being so positioned that said indentation will receive said guide means when said plate has moved beyond said guide means.

12. A device in accordance with claim 11, including counting means operated by said guide means during the passing of each plate for counting the plates in said column, whereby in the absence of a plate during reciprocation of said plunger means said guide means will be received in said indentation so as to prevent operation of said counting means by said guide means.

13. A plate stacking device comprising reciprocating plunger means for moving successive plates into nested relationship to form a column of nested plates and thereafter advancing said column, means for returning said column of plates on the return stroke of said plunger means to a given point while said plunger means returns a greater distance, means for feeding a plate in front of said reciprocating plunger means during each return stroke of said plunger means, guide means for guiding each of

said plates into nested relationship during the forward movement of said plunger means, each forward stroke of said plunger means moving the plate being fed beyond said guide means, said given point of return of said column and the length of said guide means being regulated so that the end of said guide means will be between the last plate in the column and said plate being fed forward prior to movement of said column beyond said guide means.

14. A device in accordance with claim 13, including indentations in said plunger means, said guide means and said indentations being so positioned that said indentations will receive said guiding means when the plate being fed has moved beyond said guide means.

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Almgren ----- Feb. 16, 1937
Galloway ----- Feb. 21, 1939
Sillars ----- July 6, 1943
Sillars ----- Mar. 28, 1944
Monaco ----- Sept. 19, 1944
Hitchcock ----- Nov. 20, 1945
Doering et al. ----- May 18, 1948
Burkett ----- Jan. 10, 1950
Murphy ----- Feb. 19, 1952