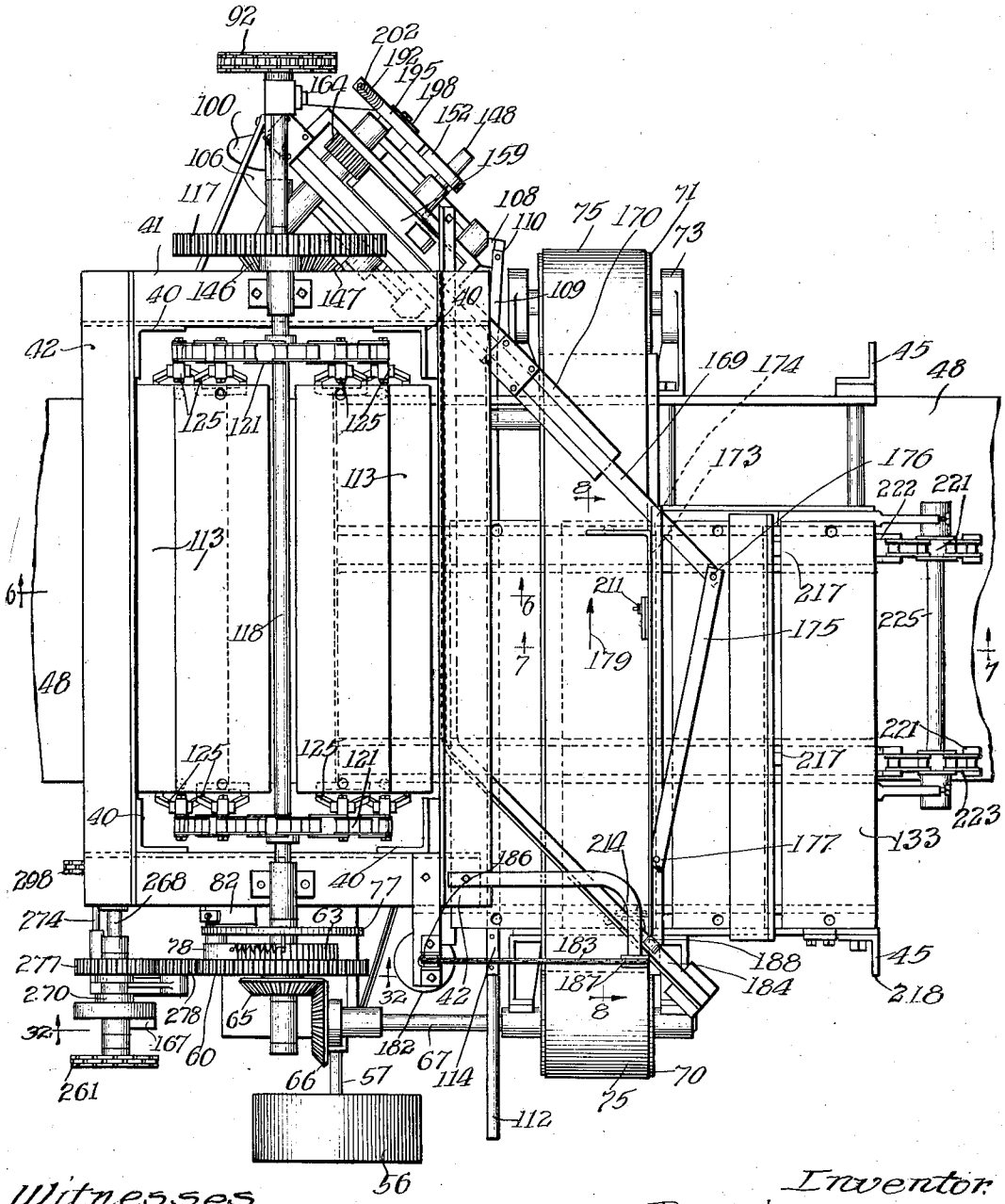
June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 1.



Witnesses

Harry C. White

William P. Kilroy

Inventor

Roy D. King.

By Anna C. King, Administratrix of Estate of Roy D. King, deceased.

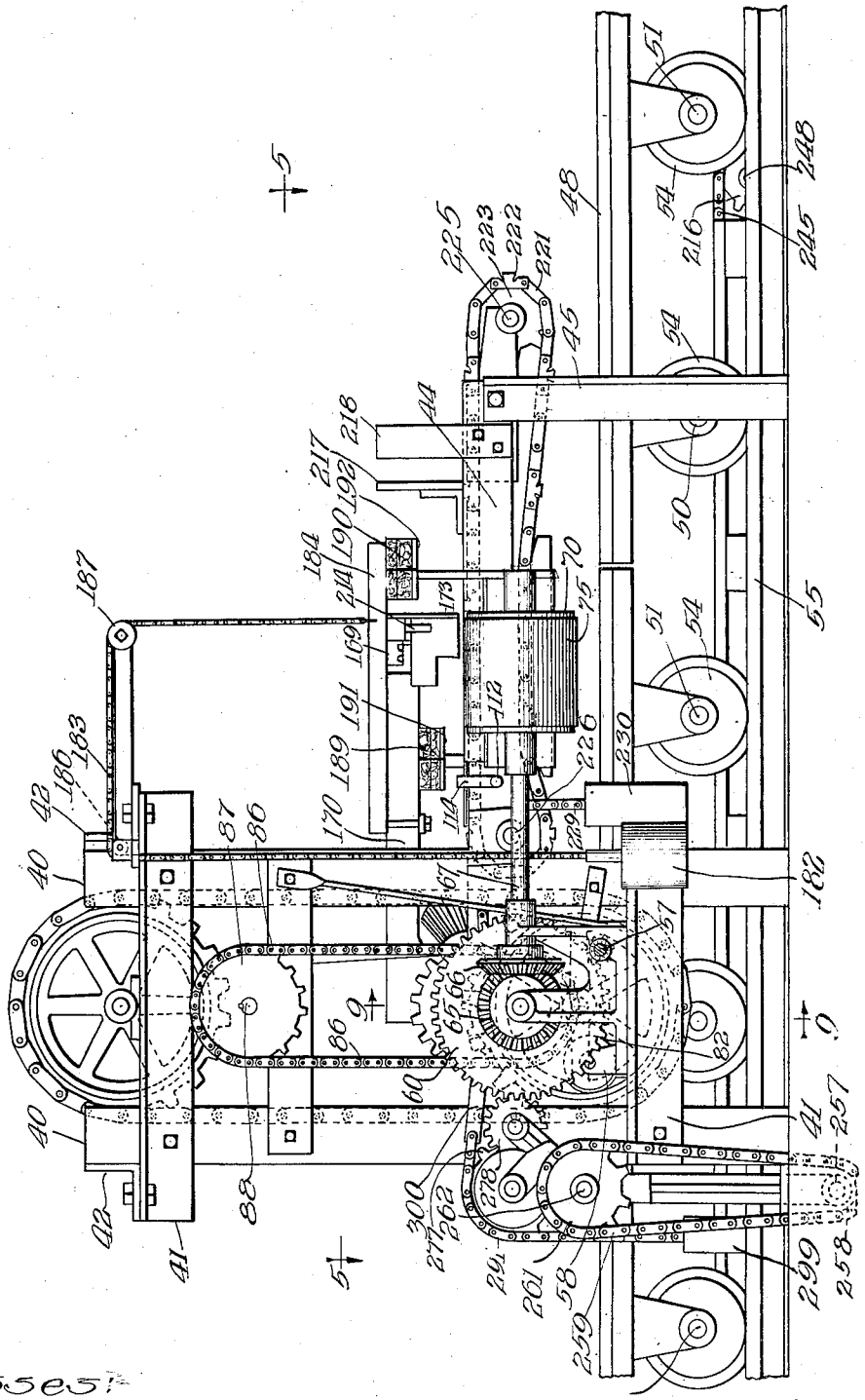
By Kill & Kill Attys

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

Filed May 28, 1926 18 Sheets-Sheet 2

Fig. 2.



Witnesses:
Harry W. L. White
William P. Kilroy

Inventor
Roy D. King.
By Anna A. King Administratrix of Estate of Roy D. King, deceased.
By Miller & Lee attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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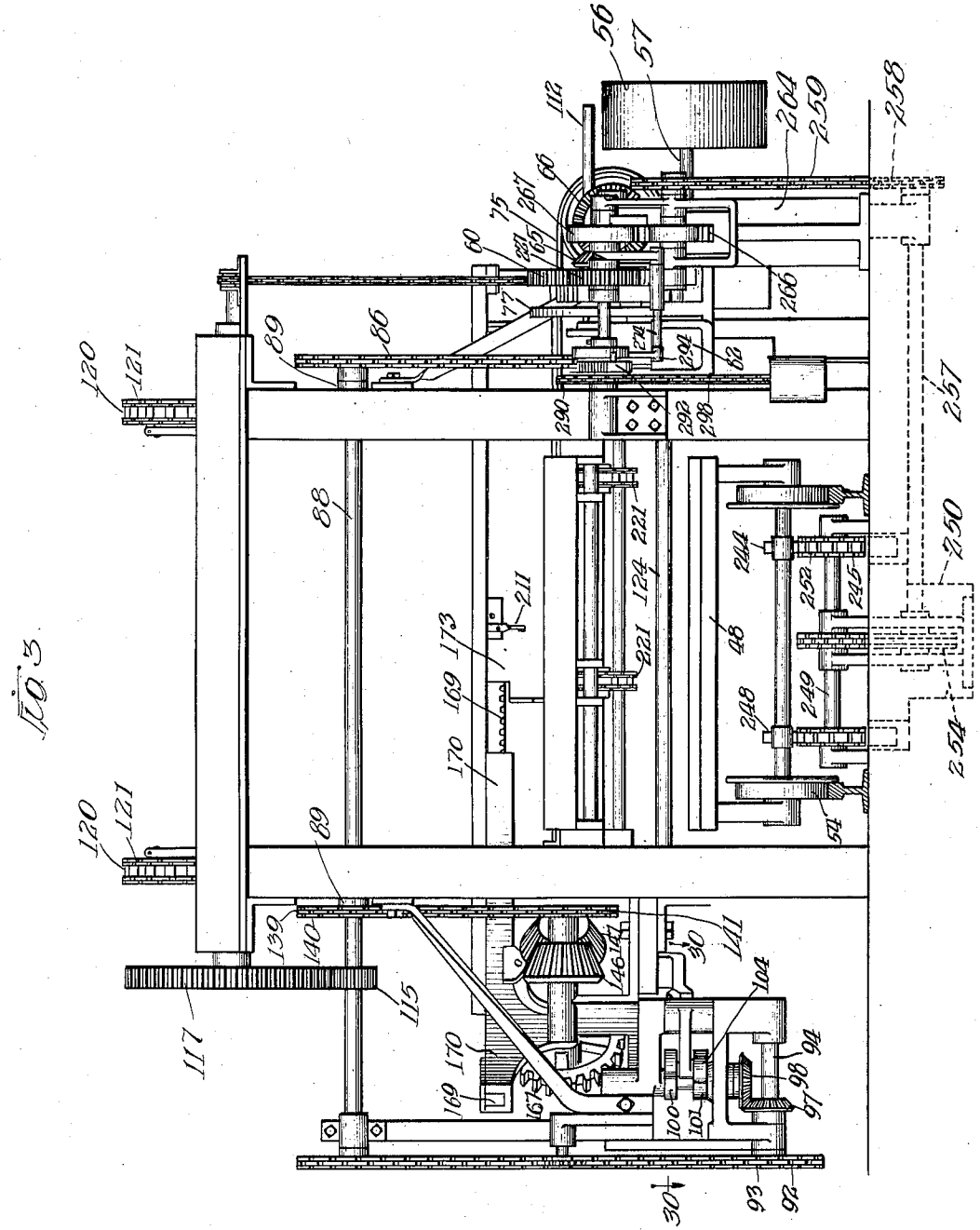


FIG. 3

Witnesses:
William R. Kilroy
Harry R. L. White

Inventor:
Roy D. King,
By Anna G. King, Administratrix of Estate
of Roy D. King, deceased,
By Niles & Niles Attys

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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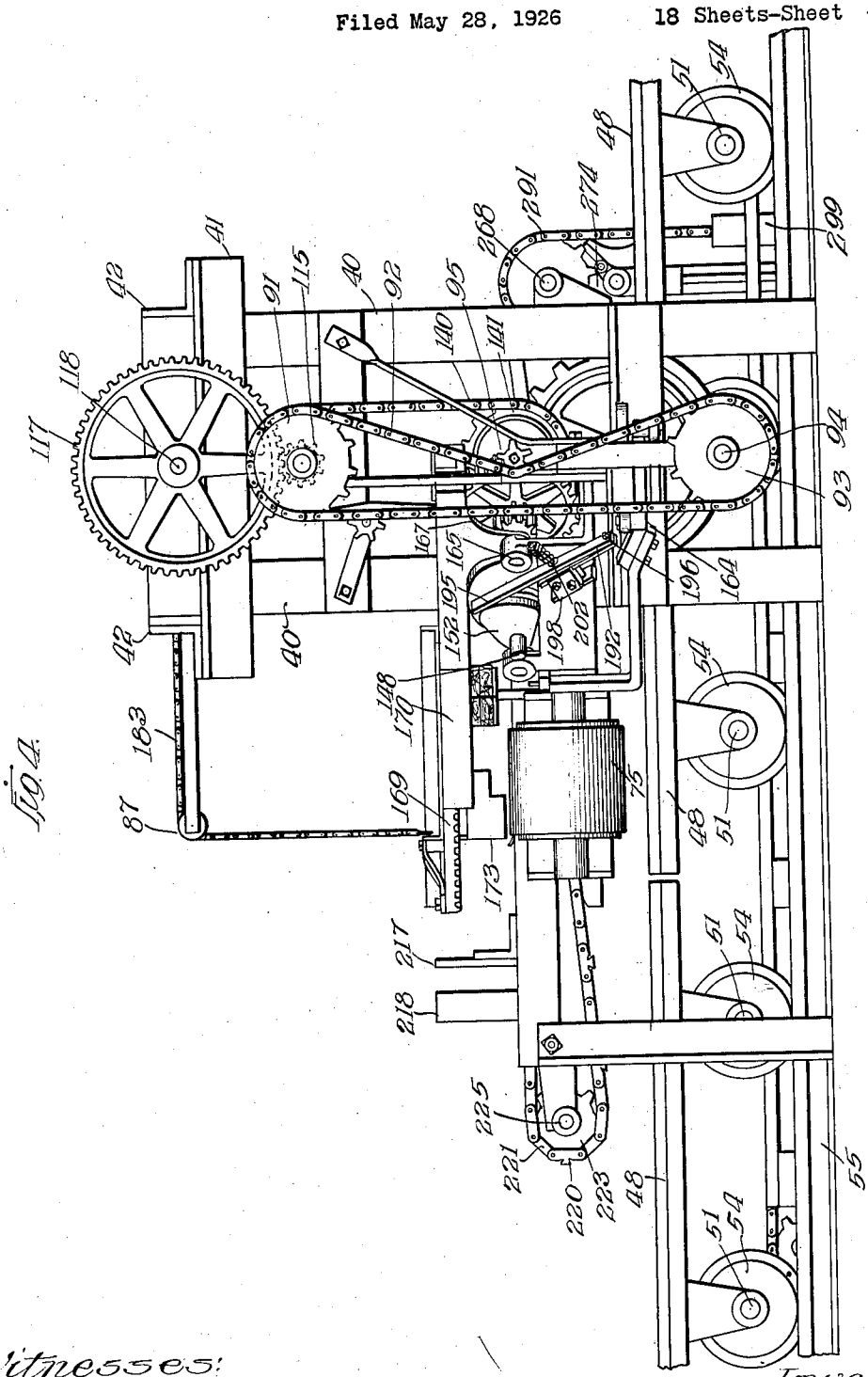


Fig. 4.

Witnesses:
Harry B. White
William R. Kilroy

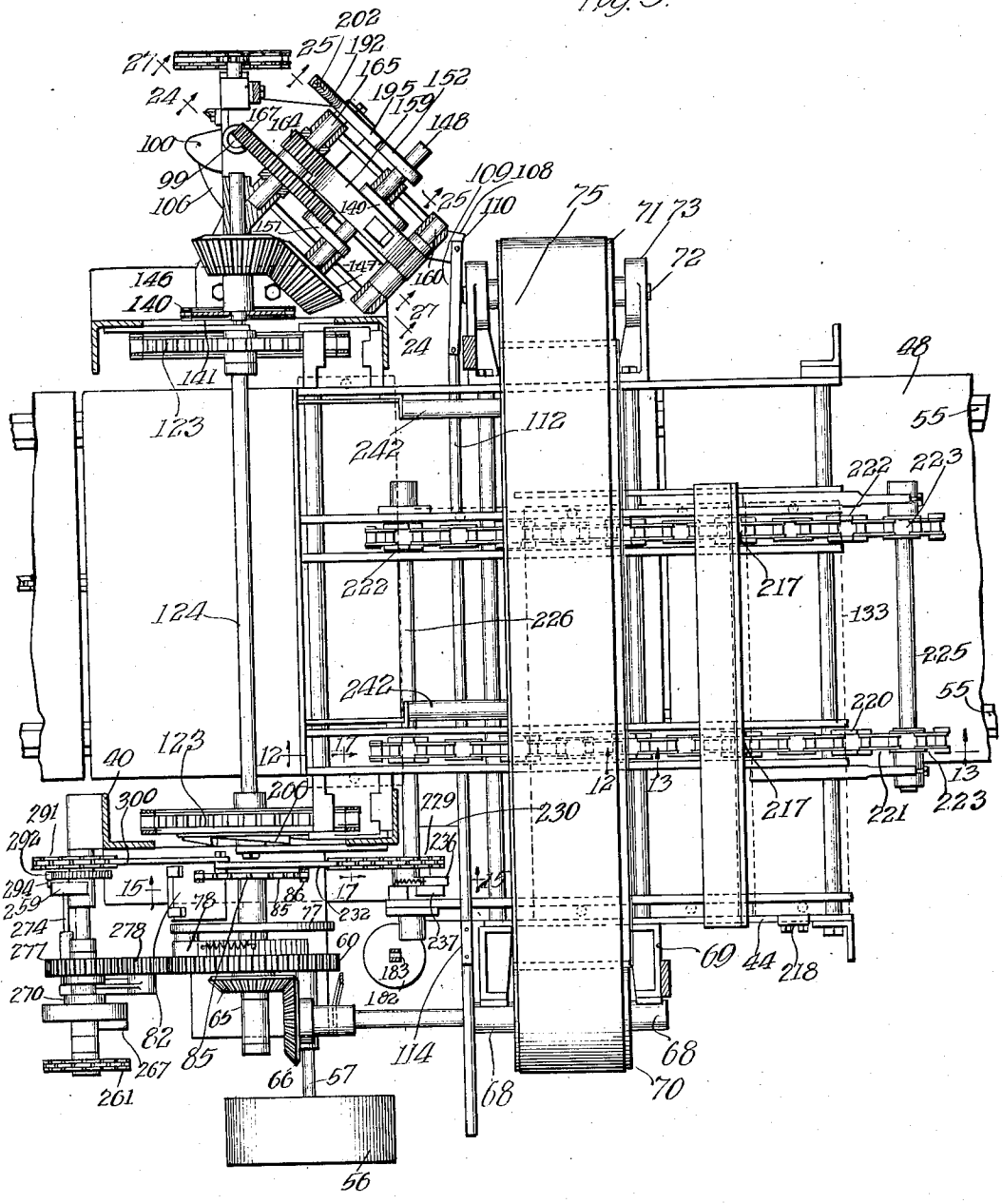
Inventor:
Roy D. King,
By Anna A. King Administratrix of Estate
of Roy D. King, deceased.
By Victor J. Evans Atty.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

Filed May 28, 1926 18 Sheets-Sheet 5

Fig. 5.



Witnesses:

Harry W. White.

William P. Kilron

Inventor:

Roy D. King

By Anna G. King, Administratrix of Estate of Roy D. King, deceased.

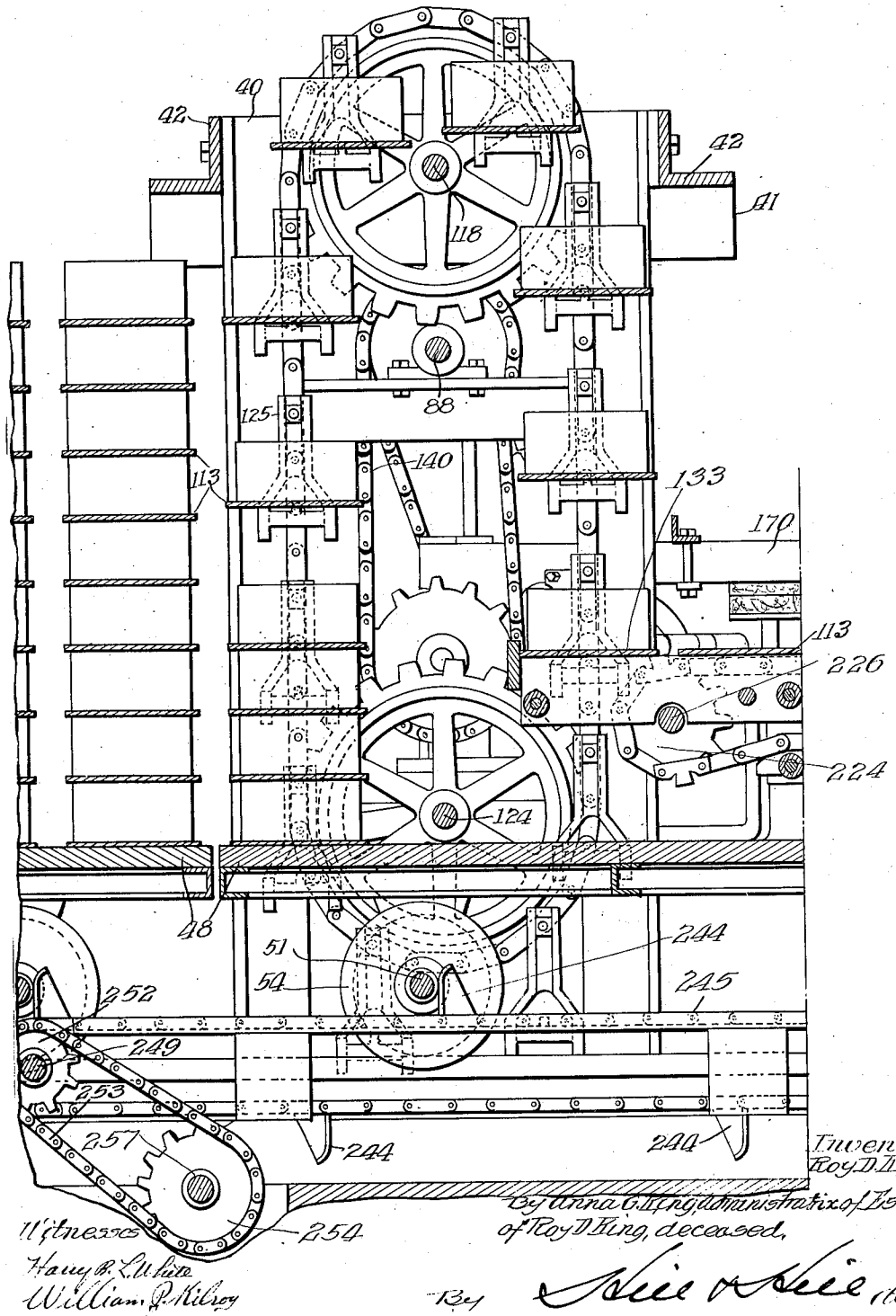
By Lee & Lee Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 6.



Witnesses
Harry B. LaMotte
William P. Kilroy

Inventor:
Roy D. King.
By Anna C. King, Administratrix of Estate
of Roy D. King, deceased.
By Kerr & Kerr Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 8.

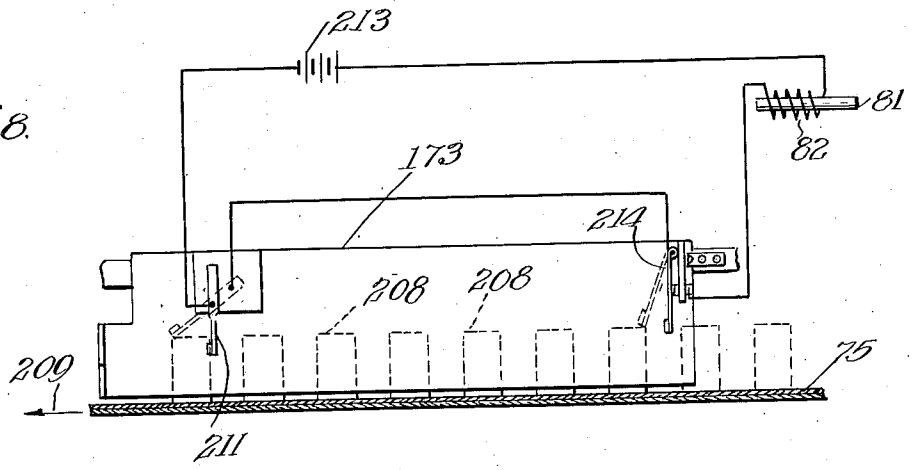
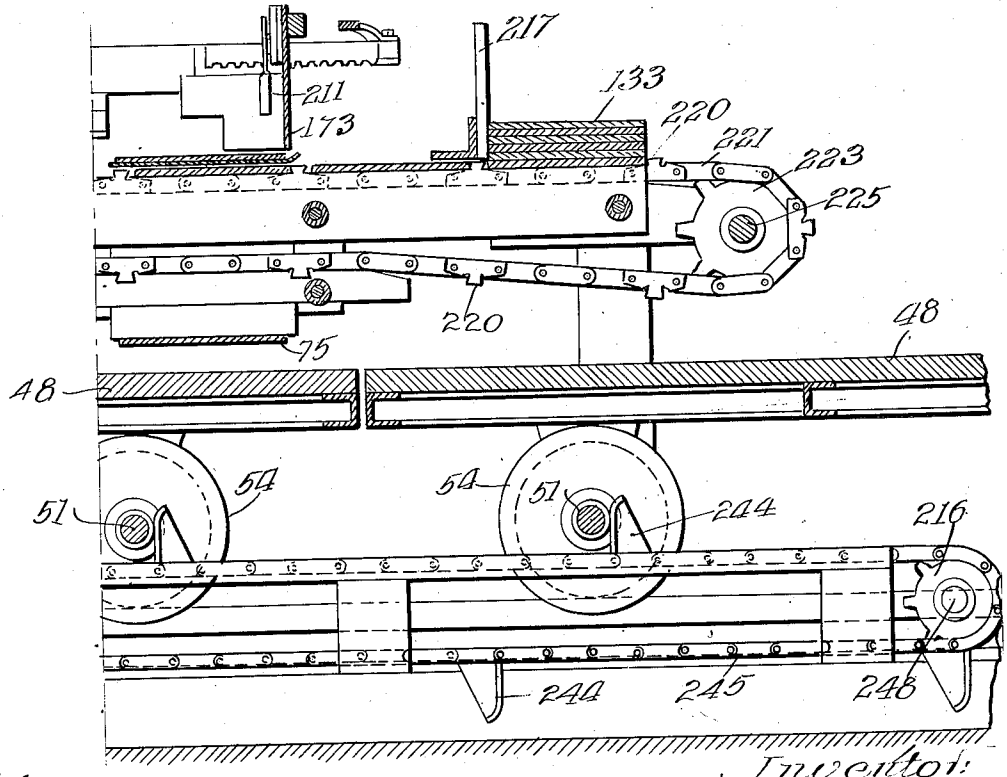


Fig. 7.



Witnesses:
Harry C. White
William L. Kilroy

Inventor:
Roy D. King,
By Anna Gitting, administratrix of the estate of Roy D. King, deceased.
By Rice & Rice Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 9.

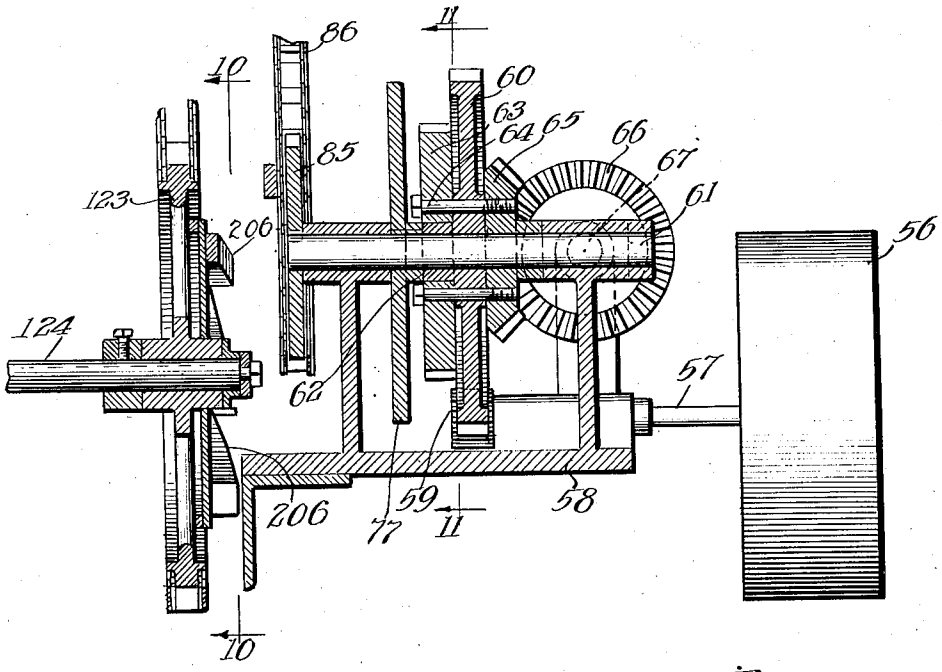


Fig. 10.

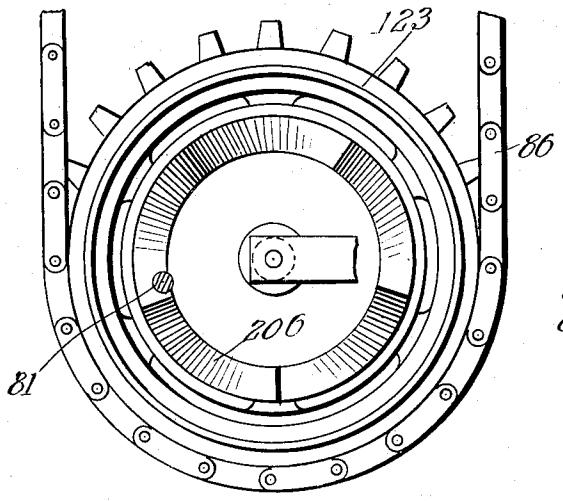
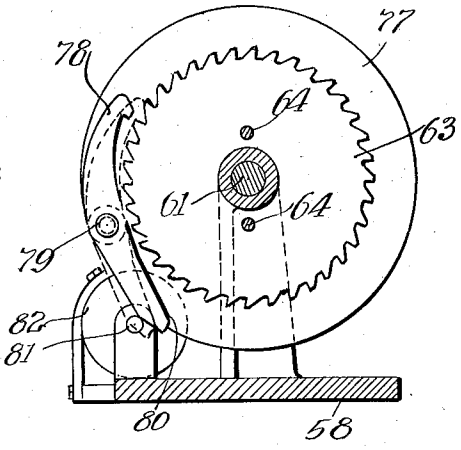


Fig. 11.



Witnesses:
Harry E. White
William P. Kilroy

Inventor:
Roy D. King.
By Anna G. King, Administratrix of Estate of Roy D. King, deceased.
By Miller & Miller Attys

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 12.

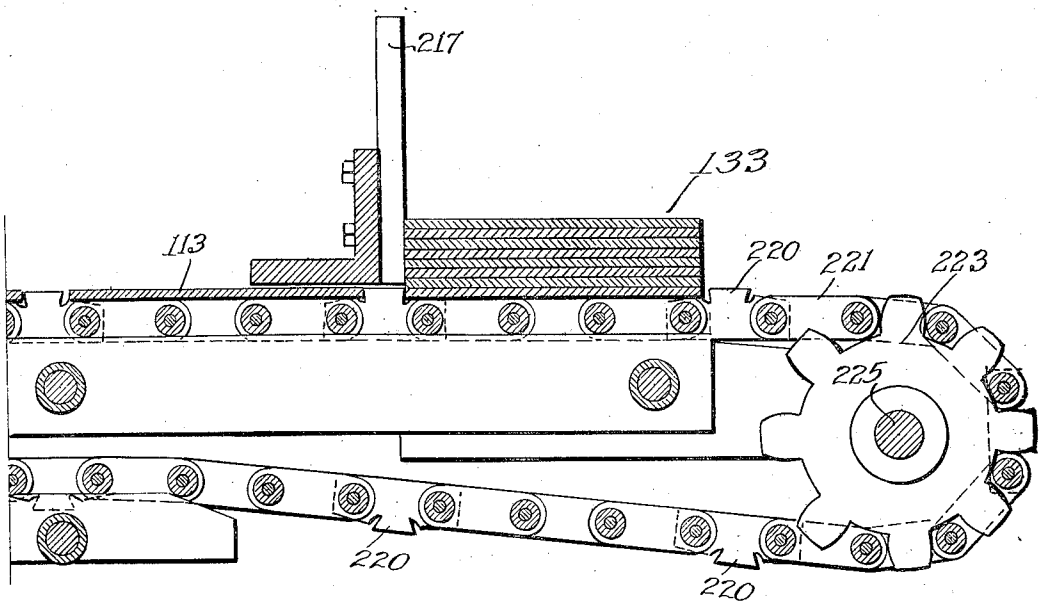
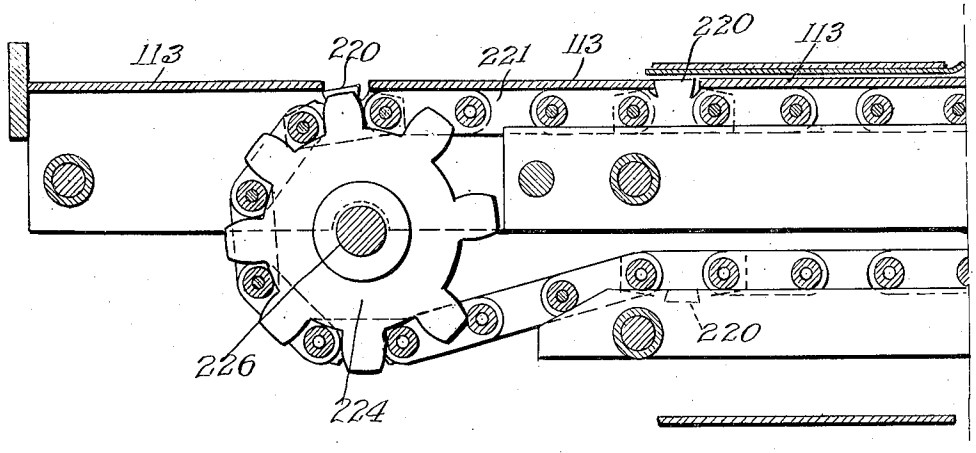


Fig. 13.

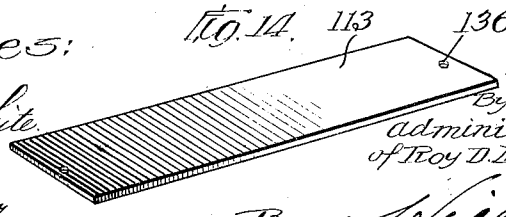


Witnesses:

Harry E. White

William P. Kilroy

Fig. 14.



Inventor:
Roy D. King.
By Anna G. King,
administratrix of Estate
of Roy D. King, deceased.
By Howson & Howson Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 15.

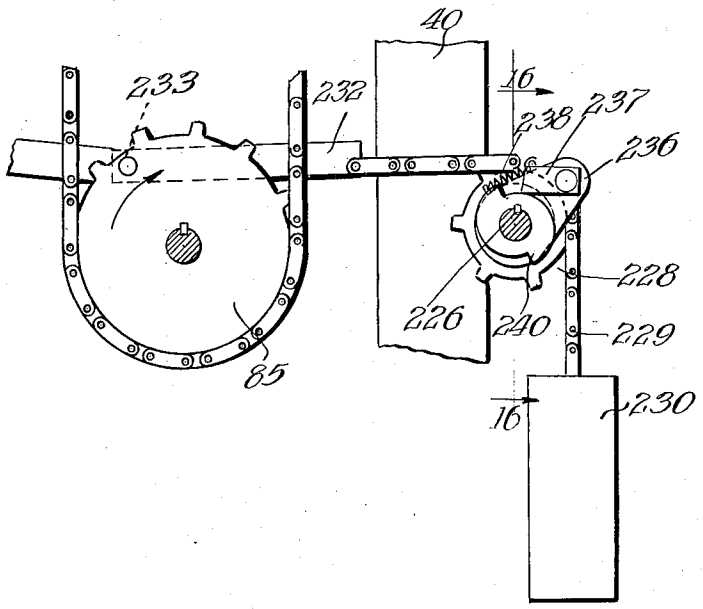
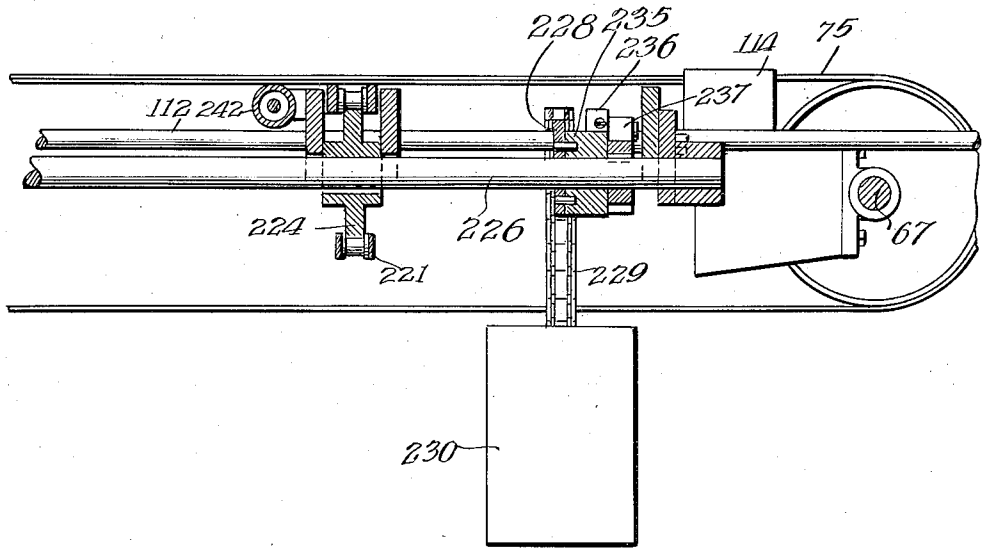


Fig. 16



Witnesses:

Harry C. White

William P. Kilroy

Inventor:

Roy D. King.

By Anna C. King, Administratrix of Estate of Roy D. King, deceased.

By Miller & Miller Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 17.

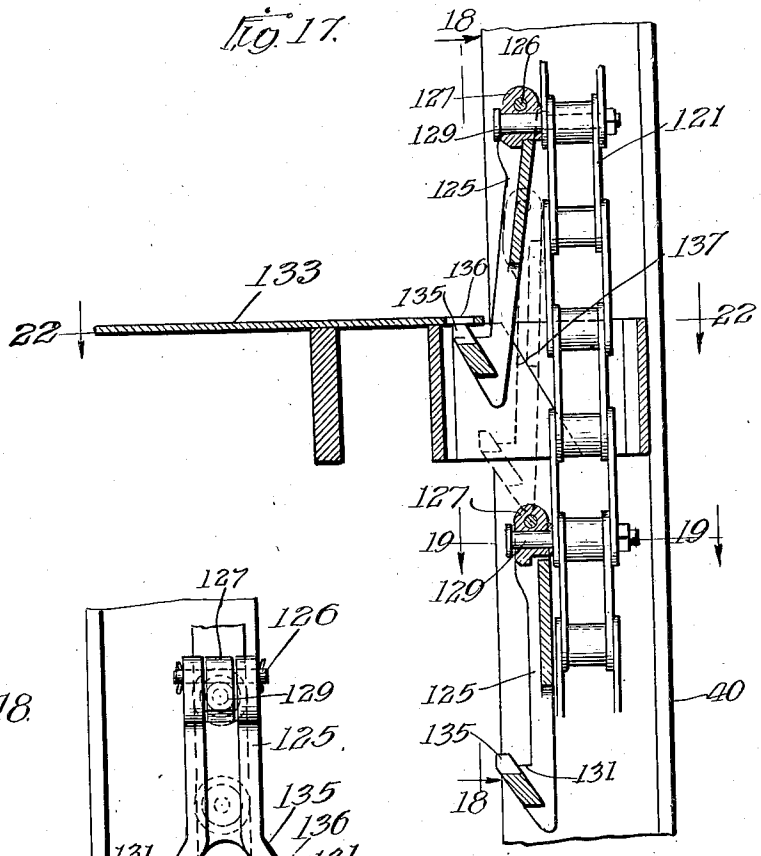


Fig. 18.

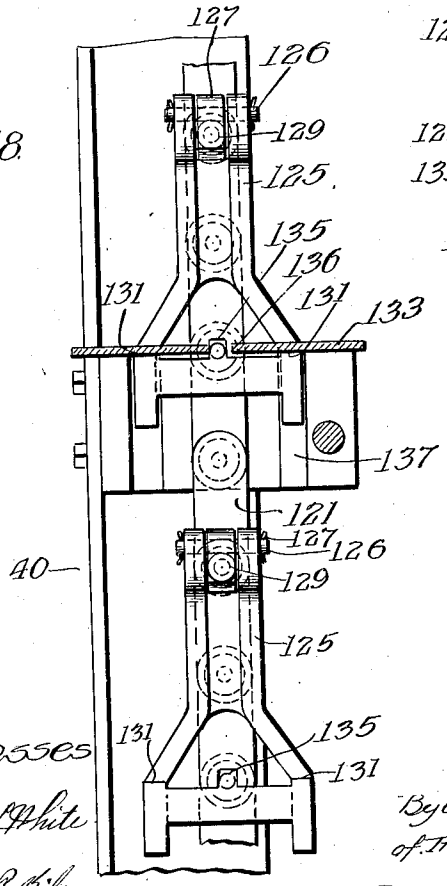
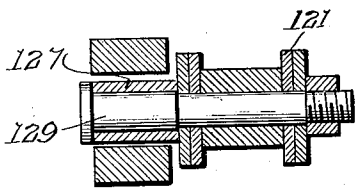


Fig. 19.



Witnesses
Harry E. White
William P. Kilroy

Inventor
Roy D. King,
By Anna G. King, Administratrix of Estate
of Roy D. King, deceased,
By Mills & Lee Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 20.

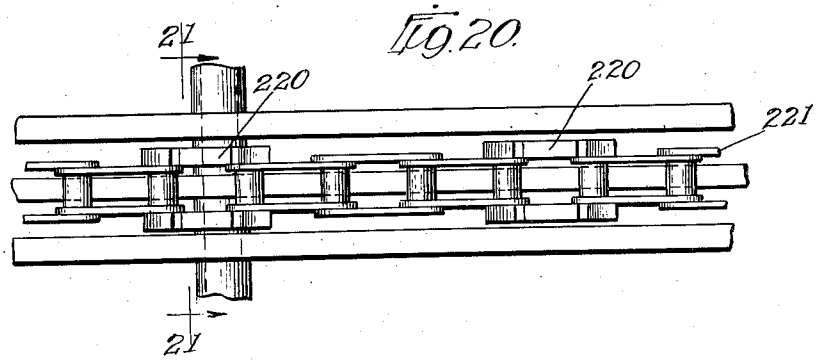


Fig. 21.

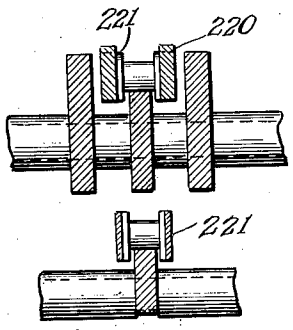


Fig. 23.

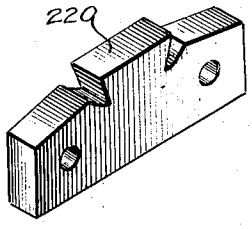
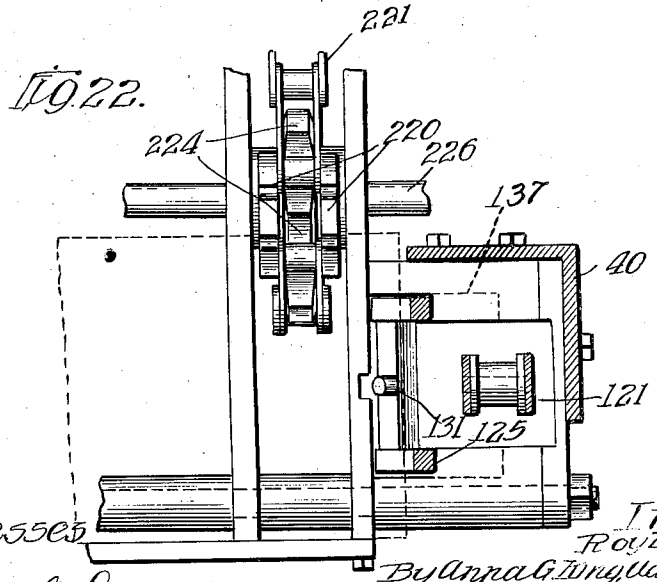


Fig. 22.



Witnesses:
Harry P. White.
William R. Kilroy

Inventor:
Roy D. King,
By Anna G. King, Administratrix of Estate of Roy D. King, deceased.
By Kerr & Kerr Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 24.

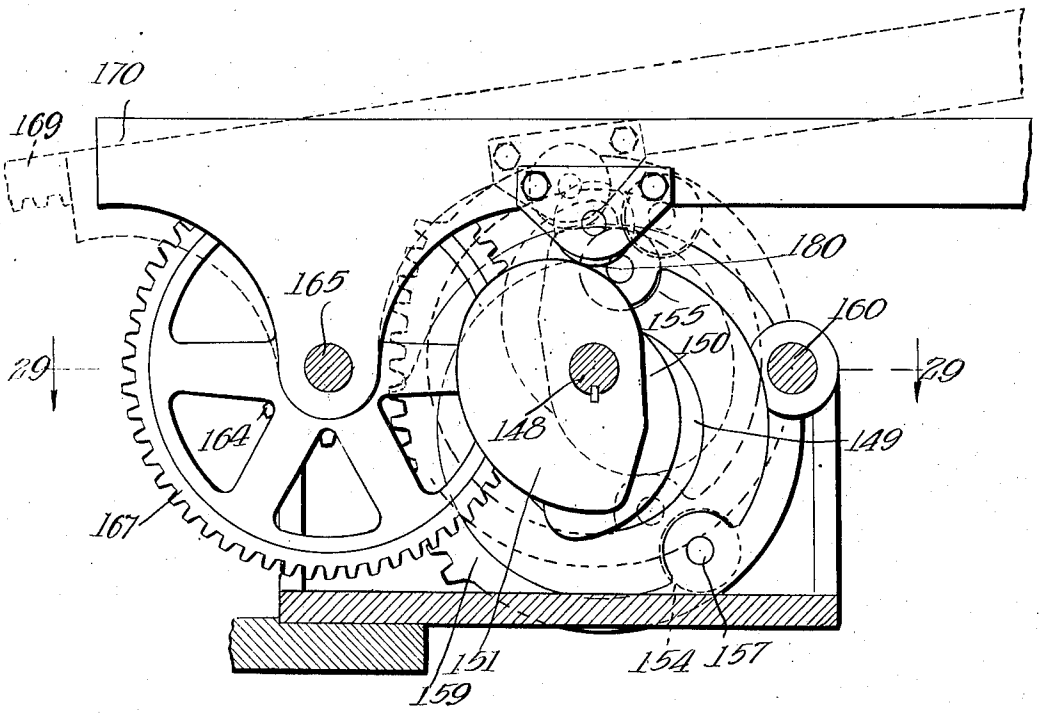


Fig. 25.

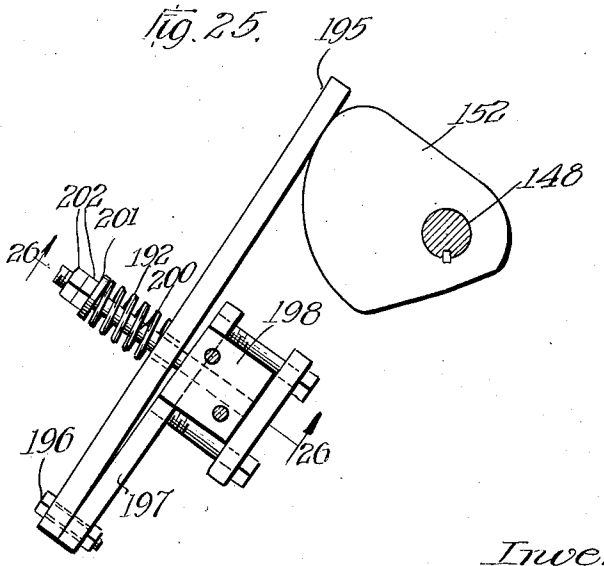
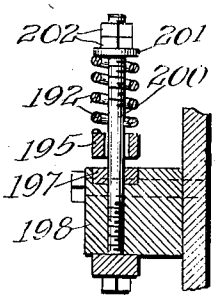


Fig. 26.



Witnesses:
Harry C. Clarke.
William P. Kilroy

Inventor:
Roy D. King.
By Anna A. King, Administratix of Estate of Roy D. King, deceased.
By Keiek & Kiek Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 27

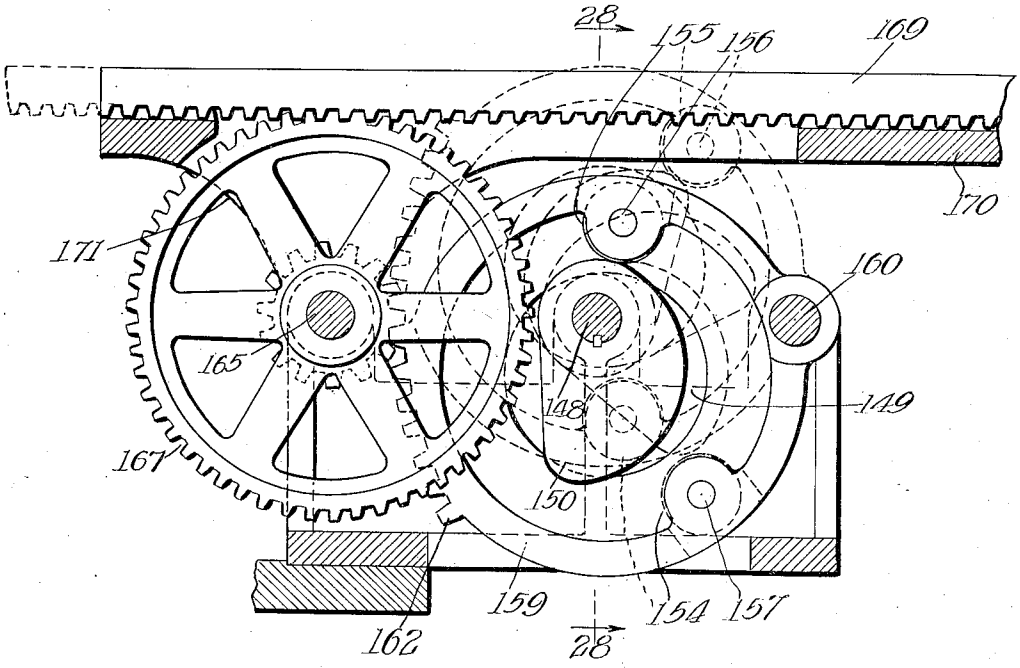
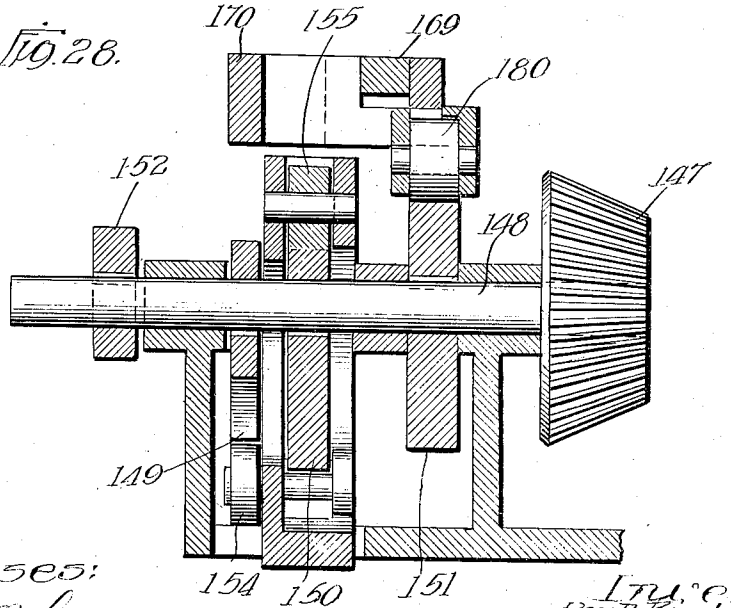


Fig. 28.



Witnesses:
Harry C. White.
William P. Kilroy

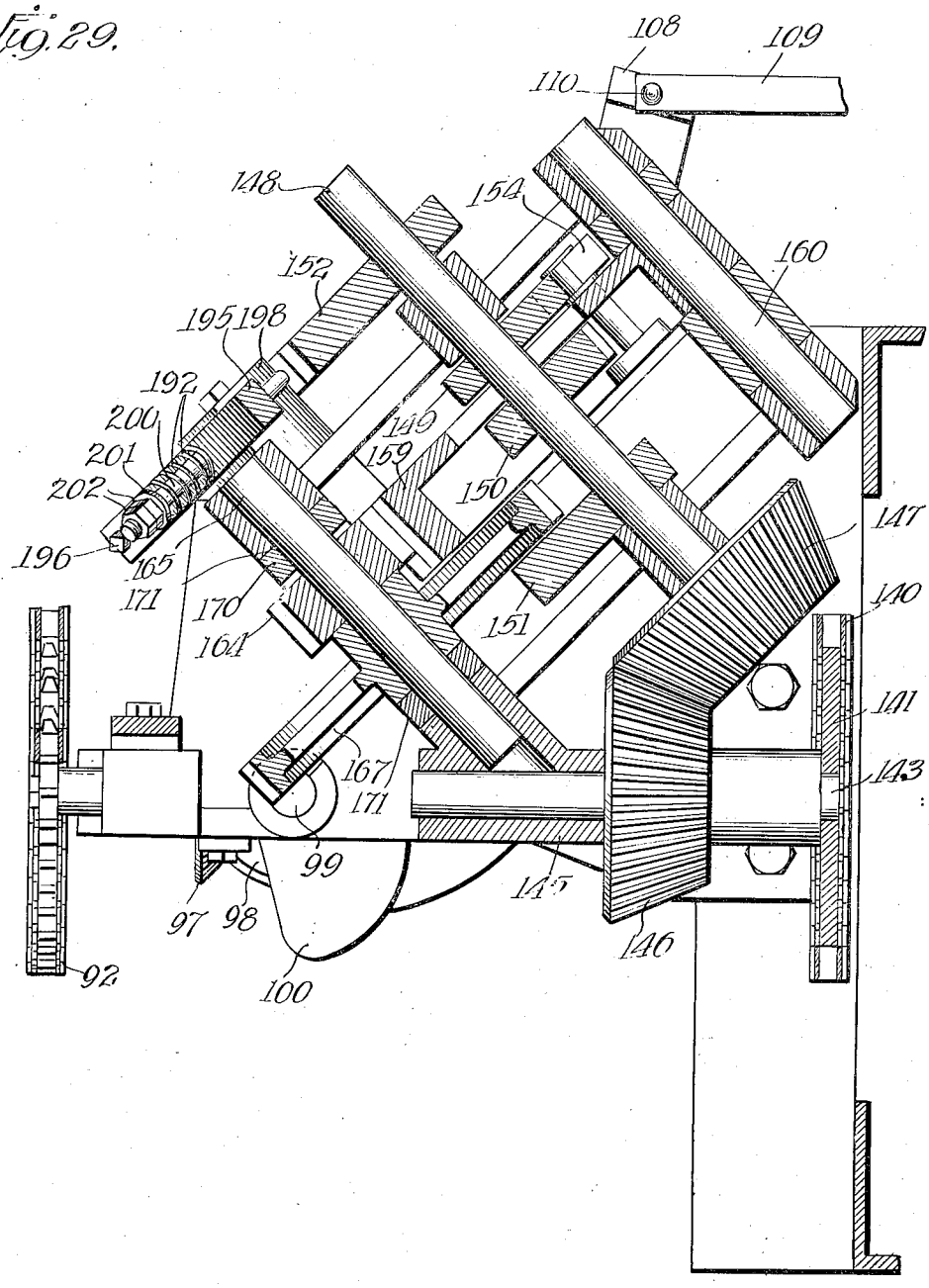
Inventor:
Roy D. King
By Anna G. King, Administratrix of Estate of Roy D. King, deceased.
By Lee & Lee Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 29.



Witnesses:

Harry D. L. White

William P. Kilroy

Inventor:

Roy D. King.

By Anna C. King, Administratrix of Estate of Roy D. King, deceased,

By Lee & Lee Attys.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 30.

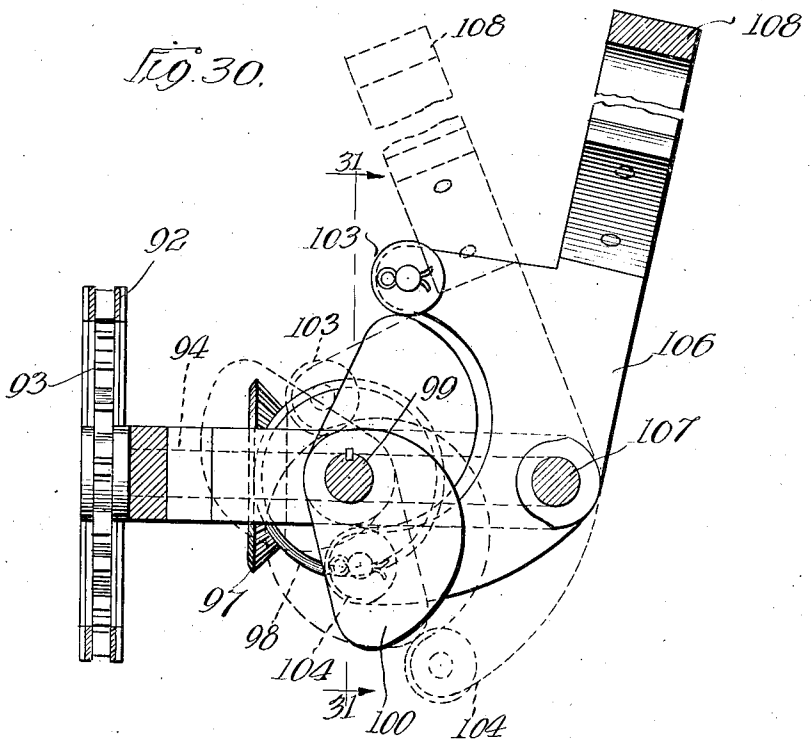
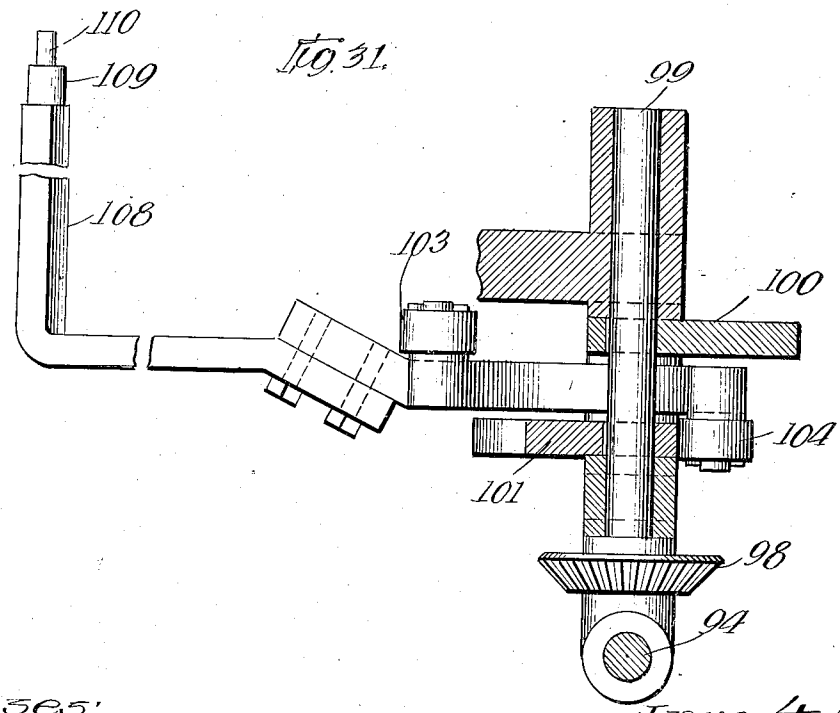


Fig. 31.



Witnesses:
Harry C. White.
William P. Kilroy

Inventor:
Roy D. King.
By Anna C. King Administratrix of Estate of Roy D. King, deceased.
By Miller Neidatts.

June 24, 1930. R. D. KING 1,767,592

MATERIAL HANDLING APPARATUS

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Fig. 32

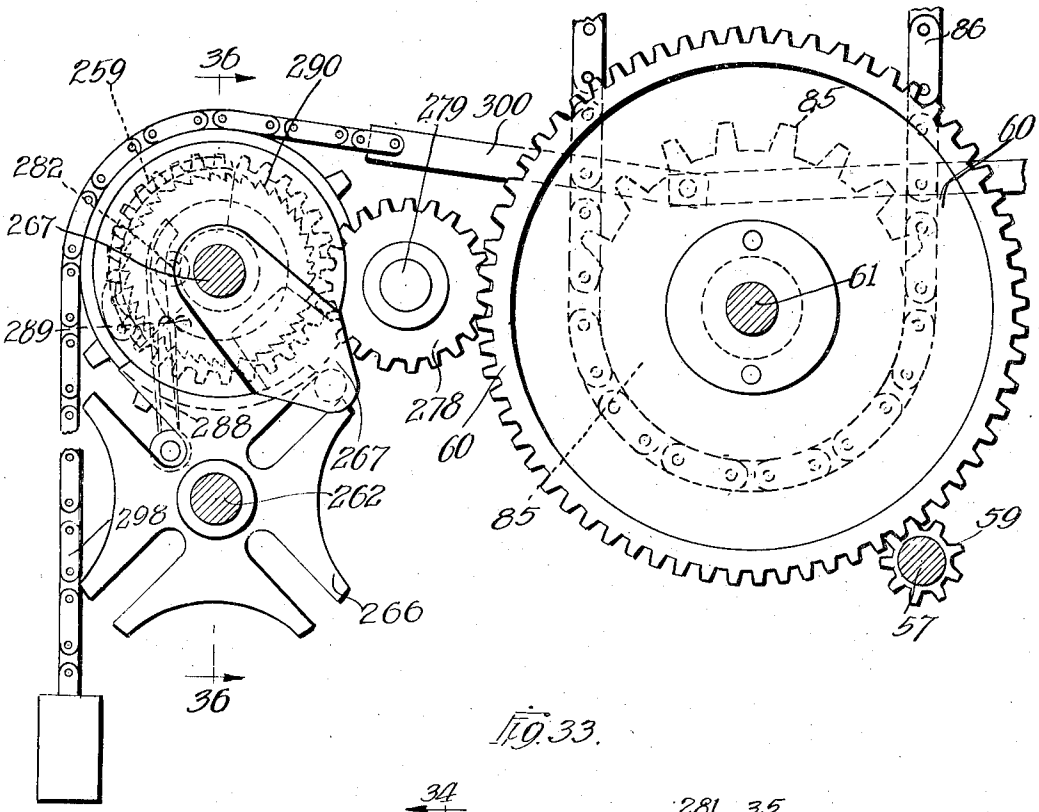
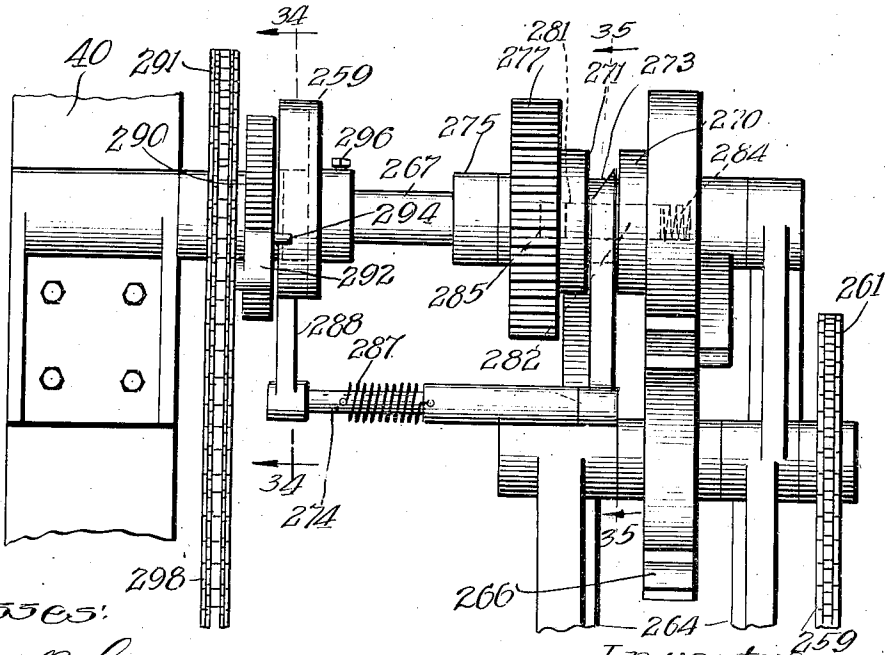


Fig. 33.



Witnesses:
Harry E. White
William S. Kilroy

Inventor
Roy D. King
By Anna Gilling, Administratrix of Estate
of Roy D. King, deceased.
by Keil & Keil Attys.

June 24, 1930. R. D. KING 1,767,592

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Fig. 34

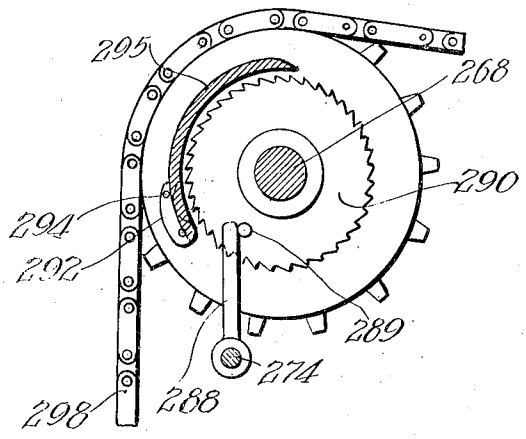


Fig. 35.

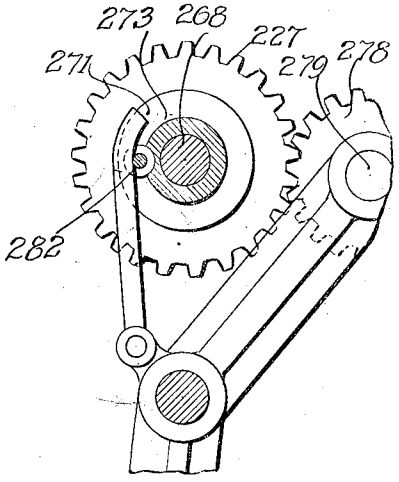
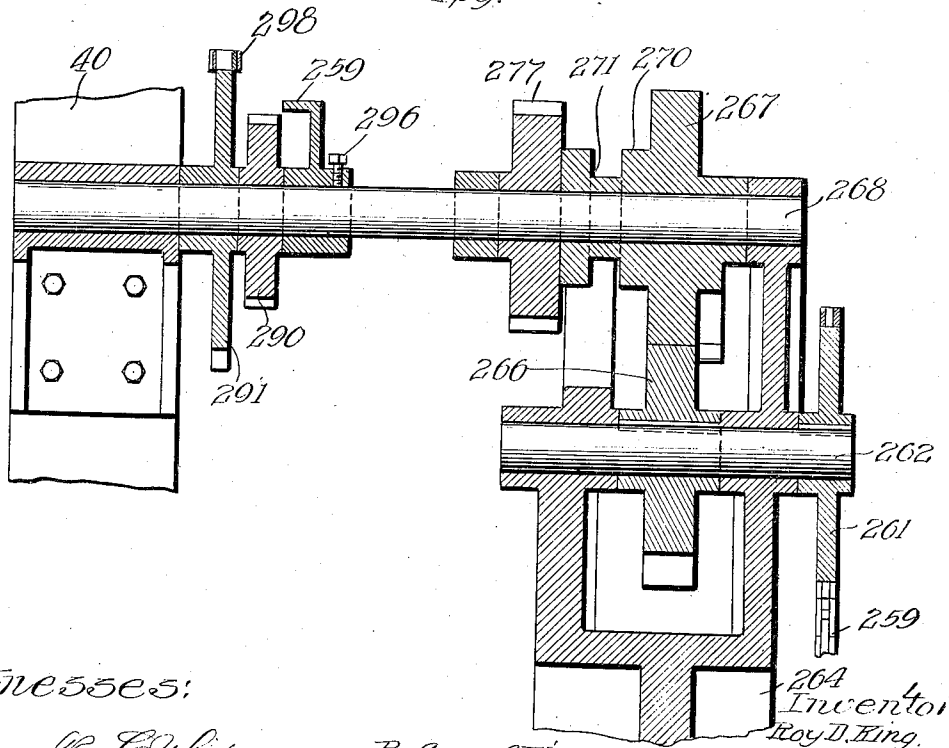


Fig. 36.



Witnesses:
Harry C. White.
William P. Kilroy

Inventor:
Roy D. King.
By Anna A. King Administratrix of Estate of Roy D. King, deceased.
By Howson & Howson Attys.

Patented June 24, 1930 1,767,592

UNITED STATES PATENT OFFICE

ROY D. KING, DECEASED, LATE OF CHICAGO, ILLINOIS, BY ANNA G. KING, ADMINISTRATRIX, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRED R. WETSEL, OF CHICAGO, ILLINOIS

MATERIAL-HANDLING APPARATUS

Application filed May 28, 1926. Serial No. 112,307.

The invention relates generally to material handling apparatus and particularly to apparatus for handling green bricks.

The invention has among its other objects the provision of apparatus of the kind described which is convenient, compact, durable and efficient.

A particular object of the invention is to provide improved apparatus for stacking green bricks preparatory to firing the same.

Another particular object of the invention is to provide apparatus of the kind described which automatically performs its functions so that a minimum of manual labor or supervision is required.

One form of the invention is embodied in apparatus which is adapted to receive green bricks from a machine which produces them and to arrange the bricks upon pallets or plates which are stacked upon trucks, the trucks being advanced automatically to space the stacks.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end the invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a plan view of apparatus embodying the invention;

Fig. 2 is a side elevation of the improved apparatus;

Fig. 3 is a rear elevation of the improved apparatus;

Fig. 4 is an elevation of the other side of the improved apparatus;

Fig. 5 is a plan section on line 5—5 of Fig. 2;

Fig. 6 is a section taken on line 6—6 of Fig. 1;

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

Fig. 8 is a diagrammatic view showing an electrical circuit forming part of the improved apparatus;

Fig. 9 is a section taken on line 9—9 of Fig. 2;

Fig. 10 is a section taken on line 10—10 of Fig. 9;

Fig. 11 is a section taken on line 11—11 of Fig. 9;

Fig. 12 is a section taken on line 12—12 of Fig. 5;

Fig. 13 is a section taken on line 13—13 of Fig. 5;

Fig. 14 is a perspective view of one of a plurality of plates employed to carry the bricks;

Fig. 15 is a section taken on line 15—15 of Fig. 5;

Fig. 16 is a section taken on line 16—16 of Fig. 15;

Fig. 17 is a section taken on line 17—17 of Fig. 5;

Fig. 18 is a section taken on line 18—18 of Fig. 17;

Fig. 19 is a section taken on line 19—19 of Fig. 17;

Fig. 20 is a fragmentary plan elevation of one of a pair of chains which advances the plates shown in Fig. 14;

Fig. 21 is a section taken on line 21—21 of Fig. 20;

Fig. 22 is a section taken on line 22—22 of Fig. 17;

Fig. 23 is a perspective view of one of the links of the chains shown in Fig. 20;

Fig. 24 is a section taken on line 24—24 of Fig. 5;

Fig. 25 is a section taken on line 25—25 of Fig. 5;

Fig. 26 is a section taken on line 26—26 of Fig. 25;

Fig. 27 is a section taken on line 27—27 of Fig. 5;

Fig. 28 is a section taken on line 28—28 of Fig. 27;

Fig. 29 is a section taken on line 29—29 of Fig. 24;

Fig. 30 is a section taken on line 30—30 of Fig. 3;

Fig. 31 is a section taken on line 31—31 of Fig. 30;

Fig. 32 is a section taken on line 32—32 of Fig. 1;

Fig. 33 is an elevation of the mechanism shown in Fig. 32, the elevation being taken looking from the left of Fig. 32;

Fig. 34 is a section taken on line 34—34 of Fig. 33;

Fig. 35 is a section taken on line 35—35 of Fig. 33; and

Fig. 36 is a section taken on line 36—36 of Fig. 32.

In the drawings, a preferred form of the invention is shown embodied in apparatus adapted to arrange green brick in superimposed rows upon trucks which are afterwards wheeled to kilns, or the equivalent. In the illustrated embodiment of the invention the various moving parts of the apparatus are preferably mounted upon a frame which, as shown, may comprise a plurality of vertical members 40 tied to each other by transverse members 41 and longitudinal members 42 (see Fig. 1). Extending forwardly from the members 40 are horizontally disposed members 44 which have their forward ends supported by vertical members 45. It will be noted that the frame is so constructed that trucks 48 may be advanced therethrough, the trucks being advanced between the vertical members 45 and between the vertical members 40. As shown, the trucks 48 are preferably provided with front and rear axles 50 and 51, respectively, which journal wheels 54 are arranged to travel upon tracks 55 (see Fig. 2).

Any suitable means may be provided for driving the improved apparatus. Thus, a pulley 56 is shown which may be connected by a belt, or the equivalent, to a countershaft or the like. The pulley 56 is fixed to one end of a shaft 57 which is rotatably journaled in a bracket 58 mounted upon one of the transverse members 41 (see Figs. 2 and 9). Secured to the other end of the shaft 57 is a pinion 59 which meshes with a gear 60 rotatably journaled upon a shaft 61 which is, in turn, rotatably journaled in the bracket 58. The gear 60 is provided with a hub 62 upon which a ratchet 63 is mounted, the ratchet 63 being rigidly secured to the gear 60 by bolts 64 which also secure a bevel gear 65 to the gear 60. Meshing with the bevel gear 65 is a bevel gear 66 fixed to a shaft 67 which is rotatably journaled in the bracket 58 and in bearing blocks 68 mounted upon brackets 69 carried by the members 44 (see Fig. 5) and mounted upon the shaft 67 and constrained to rotate therewith is a pulley 70, which is aligned with a pulley 71 mounted upon a shaft 72 disposed on the other side of the machine, the shaft 72 being rotatably journaled in brackets 73 carried by the members 44. Trained over the pulleys 70 and 71 is a belt 75 formed of any suitable material.

Referring now to Fig. 9, a disc 77 keyed to the shaft 61 carries a pawl 78 which is pivoted to the disc by a pin 79, the construction being such that the pawl 78 may engage the teeth of the ratchet 63. The pawl 78 is provided with an extension 80 engageable by a movable core 81 forming part of a solenoid 82 mounted upon the bracket 58 (see Fig. 11). When the extension 80 is engaged by the core 81 the pawl is held disengaged from the teeth of the ratchet 63, but, as hereinafter set forth in detail, the solenoid 82 may be energized to retract the core 81 whereupon the pawl 78 will engage the teeth of the ratchet 63 so that the shaft 61 will be constrained to rotate with the gear 60.

Keyed to the shaft 61 is a sprocket 85 which meshes with a sprocket chain 86 arranged to mesh with a sprocket 87 keyed to a shaft 88, the shaft 88 being journaled in bearing blocks 89 carried by the vertical members 40 (see Fig. 3). Fixed to the shaft 88 is another sprocket 91 which meshes with a sprocket chain 92 arranged to mesh with a sprocket 93 fixed to a shaft 94. Referring to Fig. 4, it will be noted that one leg of the sprocket chain 92 is trained over an idler 95. The shaft 94 is journaled in the frame and is provided with a bevel gear 97 which meshes with a bevel gear 98 mounted upon a vertically disposed shaft 99 also rotatably journaled in the frame (see Figs. 30 and 31). Keyed to the shaft 99 are cams 100 and 101 which cooperate with anti-friction rollers 103 and 104, respectively, to oscillate a bracket member 106 pivoted upon a pin 107 mounted in the frame, the rollers 103 and 104 being carried by the bracket member. Secured to the bracket member 106 is a bracket member 108 to which one end of a link 109 is pivoted by a pin 110. The other end of the link 109 is pivotally connected to one end of a bar 112 slidably journaled in the members 44 and the other end of the bar 112 is provided with a lug 114. It is readily understood that rotation of the shaft 99 causes oscillation of the bracket member 106 and it, in turn, reciprocates the bar 112, the bar 112 being connected to the bracket member by the link 109 and the member 108. The purpose of this construction will presently appear.

Referring now to Fig. 3, a pinion 115 fixed on the shaft 88 meshes with a gear 117 secured to a shaft 118 which is journaled in the frame, the shaft 118 having sprockets 120 fixed thereon meshing with sprocket chains 121 which also mesh with sprockets 123 fixed to a shaft 124 rotatably journaled in the frame. Each of the sprocket chains 121 has a plurality of attachments 125 pivoted thereto, pins 126 being provided for this purpose in brackets 127 pivotally mounted upon elongated pintles 129 forming parts of the chain (see Figs. 17, 18 and 19). Each attachment 125 terminates in a pair of spaced lugs 131 adapted to carry pallets or plates 133 upon which

rows of green brick are stacked in a manner hereinafter described and each attachment is provided with a lug 135 adapted to engage one of a pair of apertures 136 formed in each of the plates 133. As best shown in Fig. 17, the attachments 125 normally hang in positions wherein the lugs 131 and 135 cannot engage the plates 133 and are brought into positions wherein they will engage the plates 133 by cams 137 mounted upon the frame. This arrangement permits the attachments to carry a plate of green bricks from one position in the machine to another position therein and to deposit the plate upon the aforementioned trucks 48.

Fixed to the shaft 88 is a sprocket 139 which meshes with a sprocket chain 140 arranged to mesh with a sprocket 141 fixed to a shaft 143 rotatably journaled in a bracket 145 forming part of the frame (see Figs. 3 and 29), the shaft 143 being provided with a bevel gear 146 which meshes with a bevel gear 147 fixed to a shaft 148 rotatably journaled in the bracket 145. Mounted upon and constrained to rotate with the shaft 148 are cams 149, 150, 151 and 152 (see Figs. 27, 28 and 29) and engageable with the cams 149 and 150 are anti-friction rollers 154 and 155 which are rotatably journaled upon pins 156 and 157, respectively, mounted in a ring 159 pivoted upon a pin 160, the pin 160 being mounted in the bracket 145. Gear teeth 162 formed upon the ring 159 form a segment thereof and are arranged to mesh with a pinion 164 fixed to a shaft 165 rotatably journaled in the bracket 145, and constrained to rotate with the shaft 165 is a gear 167 which meshes with a rack 169 slidably journaled in a guide 170, which is pivoted upon the shaft 165 by means of brackets 171 formed integral therewith. The cams 149 and 150 are designed so that they will oscillate the ring 159 around its pivotal axis when the shaft 148 is rotated, thus imparting an oscillatory motion to the pinion 164, the shaft 165 and the gear 167. Obviously, the gear 167 will then reciprocate the rack 169 in the guide 170. As best shown in Fig. 1, the forward end of the rack 169 is fixed to a vertically disposed plate 173, as indicated at 174, and to one end of a strut 175, as indicated at 176, the other end of the strut 175 being fixed to the plate 173, as indicated at 177. When the rack 169 is reciprocated, it, in turn, reciprocates the plate 173 diagonally across the belt 75, the plate being first moved to the left (see Fig. 1) and in the direction and approximately at the same speed that the belt is moving. The direction of travel of the belt 75 is indicated by the arrow 179 in Fig. 1. After the plate 173 has been moved across the belt 75 it is returned to the position wherein it is shown in Fig. 1. The function of the plate 173 is to push green bricks from the belt 75 onto one of the aforementioned plates 133, after which the plate is engaged by a pair of attachments 125 and carried by the chains 121 into a position wherein it may be deposited upon one of the trucks 48.

Figs. 24 and 28 illustrate the manner in which the cam 151 cooperates with an anti-friction roller 180 mounted upon the guide 170 to tilt the guide around its pivotal axis, which, of course, is the longitudinal axis of the shaft 165. The mechanism is arranged so that the plate 173 moves in a substantially horizontal plane when it is moved to the left (Fig. 1) across the belt 75, but during the major portion of its return stroke it is lifted above the belt and falls toward the belt only at the end of the return stroke. The plate 173 and the remainder of the mechanism pivoted upon the shaft 165 are counterbalanced by a weight 182 secured to one end of a chain 183, which has its other end secured to an angle iron guide 184 secured to the guide 170, the chain 183 being trained over idlers 186 and 187 mounted in the frame. An anti-friction roller 188 mounted upon the plate 173 rides upon the angle iron guide 184 and supports one end of the plate when it is moved across the belt 75 to push bricks therefrom. The downward movement of the plate 173 and of the mechanism moving therewith is cushioned by resilient pads 189 and 190 supported upon pedestals 191 and 192, respectively, mounted upon the frame, the pad 189 being engageable by the guide 170 and the pad 190 being engageable by the angle iron guide 184. To retard the downward movement of the plate 173 means is preferably provided which comprises the aforementioned cam 152. Positioned upon the shaft 148 and frictionally engageable with the cam 152 is a bar 195 loosely pivoted by a bolt 196 to a bar 197. The bar 197 is clamped to a block 198 rigidly secured upon one end of the shaft 165. A compression spring 199 disposed around a rod 200 projecting from the block 198 urges the bar 195 toward the cam 152, the spring having one of its ends resting against the bar 195 and having the other of its ends resting against a washer 201 held upon the rod by nuts 202. The mechanism is timed so that the bar 195 engages the cam 152 just as the plate 173 commences to move down toward the belt 75 at the end of the its return stroke and thus prevents the plate from striking the belt with a sharp blow and from causing undesirable vibration.

Referring now to Figs. 5, 9 and 10, it will be noted that one of the sprockets 123 is so positioned with respect to the solenoid 82 that the core 81 may be engaged by cams 206 mounted upon the sprocket, the cams being five in number and being circumferentially arranged with respect to the axis of rotation of the sprocket. When the machine is in operation, the solenoid 82 is intermittently energized by means hereinafter described and

each time the solenoid is energized the pawl 78 engages the teeth of the ratchet 63 and permits the gear 60 to rotate the shaft 61. However, the shaft 61 only makes one complete revolution each time the solenoid is energized as for each revolution of the shaft 61 the sprockets 123 are advanced through one-fifth of a revolution. This permits one of the cams 206 to engage the core 81 and to move it into the path of the extension 80 of the pawl 78 in such manner that the pawl is tripped out of engagement with the ratchet when the shaft 61 completes its revolution. This construction permits the pulley 56 to be driven continuously but at the same time permits the apparatus to be controlled by the green bricks supplied thereto. Thus, in Fig. 8 is illustrated a circuit including the solenoid 82 whereby the green bricks control the operation of the improved apparatus. It may be mentioned at this point that my invention is not concerned with the method employed in producing the green bricks, nor is it concerned with the apparatus for feeding the green bricks to the apparatus shown in the drawings. Any suitable means may be provided for feeding the green bricks to the belt 75 in such manner that the bricks are fed to the belt in spaced relation. The illustrated embodiment of the invention is particularly adapted to handle standard sized brick, the dimensions of which are generally 2 x 4 x 8 inches, the bricks being arranged transversely of the belt in such manner that each has one of its 2 x 8 inch faces in contact with the belt. The green bricks are shown in dotted lines at 208—208 in Fig. 8, the direction of travel of the belt being indicated by an arrow 209 and the bricks being disposed so that seven of them are disposed directly in front of the plate 173 and an eighth brick is disposed in front of the right hand (Fig. 8) edge of the same plate. When the bricks 208 are moved in the positions wherein they are shown in Fig. 8, the foremost brick will bring a switch 211 into its closed position as indicated in dotted lines in the same figure. One terminal of the switch 211 is connected to a storage battery 213, or the equivalent, and the other terminal is connected to one terminal of a switch 214, the other terminal of the switch 214 being connected to one terminal of the solenoid 82 which has its other terminal connected to the battery 213. When the bricks 208 are correctly positioned upon the belt 75 and the foremost brick is holding the switch member 211 in its closed position the switch 214 will remain in its closed position, as indicated in full lines in Fig. 8. Electrical current will then flow from the battery 213 through the switch 211, the switch 214 and through the winding of the solenoid 82 back to the battery 213. When the solenoid is so energized its core 81 is disengaged from the extension 80 of the pawl 78 and the pawl 78 engages the ratchet 63 in the manner above described. Obviously, the solenoid 82 will not be energized unless the switch 211 is closed by one of the green bricks 208 and unless the green bricks are so positioned that the switch 214 will remain in its closed position. Assuming that eight bricks 208 are fed onto the belt 75 in such manner that they permit the solenoid 82 to become energized, it is obvious from the foregoing description that the shaft 61 will make one complete revolution and that this rotation of the shaft 61 will be transmitted to the shaft 88 by the sprocket chain 86, which is adapted to drive the shaft 118 through the pinion 115 and the gear 117 and is also adapted to drive the shafts 94 and 143 through the sprocket chains 92 and 140, respectively. It is apparent that with the exception of the pulley 56, the belt 75 and the mechanism gearing the belt to the pulley, all of the above described apparatus is driven intermittently but functions through a complete cycle of operations each time the electrical circuit shown in Fig. 8 is closed by the bricks 208.

When the plate 173 is advanced across the belt 75 in the manner described, it pushes eight of the bricks before it as the brick shown in front of the right hand (Fig. 8) edge of the plate 173 is advanced by the belt 75 during the initial movement of the plate 173. The plate 173 pushes the bricks from the belt 75 onto one of the aforementioned plates 133, means being provided for advancing the plates 133 through the apparatus in synchronism with the movements of the plate 173.

As best shown in Figs. 1, 7 and 12, a stack of plates 133 are preferably positioned upon the members 44, the plates being positioned against a plurality of vertical stops 217 which engage side edges of the plates. The ends of the plates are aligned against a stop 218 rigidly secured to one of the members 44 (see Fig. 2), and the side edges of the plates 133 not engaged by the stops 217 are engageable by lugs 220 formed upon the links of sprocket chains 221 meshing with sprockets 223 and 224, which are fixed upon shafts 225 and 226, respectively. The shafts 225 and 226 are rotatably journaled in the frame, the shaft 226 being intermittently rotated by means comprising a sprocket 228 journaled thereon and arranged to mesh with a sprocket chain 229, which has one of its ends secured to a weight 230 and has the other of its ends secured to one end of a link 232, the other end of the link 232 is pivoted to the sprocket 85 by a pin 233 (see Figs. 15 and 16). Constrained to rotate with the sprocket 228 is a collar 235 having a lever 236 upon which a pawl 237 is pivoted, the pawl being urged by a spring 238 toward a ratchet 240 keyed to the shaft 226. Each time the sprocket 85 makes one complete

revolution during the operation of the improved apparatus the link 232 is reciprocated and during its movement to the right (Fig. 15) angularly displaces the pawl 237 around and relative to the ratchet 226. Then, when the link 232 moves to the left (Fig. 15), the pawl 237 engages a tooth of the ratchet 240 and rotates the pawl and shaft 226 a distance which will insure that the lugs 220 on the sprocket chains 221 will advance the plates 133 engaged by the lugs through a predetermined distance, the stops 217 being spaced from the sprocket chains 221 so that plates 133 may be removed one at a time from the bottom of the pile thereof stacked upon the members 44 (see Fig. 7). The arrangement is such that when a plate 133 is withdrawn from the stack, it is advanced step by step until it lies in a position adjacent the belt 75, which position permits the plate 173 to push eight of the green bricks from the belt onto the plate 133. When green bricks are being transferred from the belt 75 to one of the plates 133, the plate is longitudinally displaced to travel with the belt at a speed substantially equaling the speed of the belt. This is the function of the aforementioned bar 112, the bar 112 being provided with the lug 114 adapted to engage one end of the plate and to move the plate in the direction the belt is traveling. When one of the plates 133 is so displaced, it travels upon rolls 242 journaled in the frame (see Fig. 5) and after the bricks have been transferred from the belt to the plate, the plate is advanced laterally another step by the chains 221 during the next movement of the chains. This brings the plate with its load of bricks into alignment with the attachments 125 carried by the chains 121.

Referring to Fig. 6, it will be noted that the plate 133 rests upon the members 44 when it is aligned with the attachments 125. It is, of course, understood that the chains 121 are driven intermittently and therefore it will be readily understood that after a plate 133 has been aligned with the attachments 125, the attachments may be made to engage the plate in the manner above described so that the plate will be advanced step by step with the chains 121 until it may be deposited or stacked upon one of the trucks 48, the trucks being preferably of such size that five stacks of plates 133 carrying green bricks may be arranged transversely thereof. In the illustrated embodiment of the invention, each stack consists of nine plates 133 (see Fig. 6). Assuming that a new stack is to be started upon one of the trucks 48, the chains 121 will advance one of the plates 133 step by step until the plate rests upon the truck, whereupon the attachments will fall away from the plate and continue traveling with the chains while the plate remains upon the truck. The next plate 133 will come to rest upon the green bricks carried by the first plate 133. This sequence of operations is continued until the stack is nine plates high, after which the truck is advanced a distance sufficient to permit another stack of plates to be arranged thereon. The trucks are so designed that after one truck has been completely covered with stacks of plates carrying green bricks, another truck may move into position without interrupting the operation of the machine.

Means is provided for advancing the trucks 48 automatically, the means preferably comprising attachments 244 carried by sprocket chains 245 and adapted to engage the axles 50 and 51 of the trucks. The sprocket chains 245 mesh with sprockets 246 and 247 mounted upon shafts 248 and 249, respectively, which are journaled in suitable bearing blocks projecting from a pit 250 formed in the support upon which the vertical members 40 and 45 rest. Fixed to the shaft 249 is a sprocket 252 which meshes with a sprocket chain 253 arranged to mesh with a sprocket 254 fixed to a shaft 257 rotatably journaled in bearing blocks positioned in the pit 250. As best shown in Fig. 3, the shaft 257 extends to one side of the machine and is provided with a sprocket 258 which meshes with a sprocket chain 259 arranged to mesh with a sprocket 261 fixed to a shaft 262, the shaft 262 being rotatably journaled in a standard 264. Keyed to the shaft 262 is a Geneva gear member 266 arranged to co-operate with a Geneva gear member 267 rotatably journaled upon a shaft 268 which has one end journaled in the standard 264 and has the other end journaled in the frame (see Fig. 36) and cut in a hub 270 formed integral with the Geneva gear member 267 is an annular groove 271 adapted to accommodate a cam member 273 fixed to a shaft 274 which is pivoted in the standard 264 (see Fig. 33). Arranged adjacent the hub 270 and held against displacement relative thereto by a collar 275 is a gear 277 which meshes with an idler 278 mounted upon a pin 279 projecting from the frame. The idler 278 meshes with the aforementioned gear 260 which is continuously driven by the pinion 59 when the apparatus is in operation. Slidably journaled in a bore 281 formed in a hub 270 is a pin 282 which is urged by a compression spring 284 toward a notch 285 formed in the gear 277 but is normally held disengaged therefrom by the cam member 233, which is adapted to withdraw the pin from engagement with the notch against the action of the spring 284. The pin 282 together with the spring 284 and the cam member 273 forms an over-running clutch of a type well known to those skilled in the art, the construction being such that if the cam member 273 is withdrawn from the groove 271 the spring 284 will urge the pin 282 against the gear 277 until the notch 285 reg-

isters with the bore 281 whereupon the pin will enter the notch 285 and the Geneva member 267 will rotate with the gear 277 until the cam member 273 again enters the groove 271. In the present instance, the construction is such that when the pin 282 engages the notch 285 it remains in engagement therewith until the Geneva gear member 267 has made one complete revolution whereupon it is disengaged from the notch. The means for moving the cam member 273 into the groove 271 comprises a spring 287 wound around the shaft 274, the spring having one of its ends fixed to the shaft and having the other of its ends fixed to the standard 264. The means for withdrawing the cam member 273 from the groove 271 comprises a lever 288 projecting into the path by a pin 289, which projects from a ratchet 290 mounted upon the shaft 268. Arranged adjacent the ratchet 290 is a sprocket 291 upon which a pawl 292 is pivoted in such manner that it is aligned with the ratchet 290 and the pawl is provided with a pin 294 adapted to ride upon a cam member 295 fixed to the shaft 268 by a set screw 296. Meshing with the sprocket 291 is a sprocket chain 298 which has one of its ends fixed to a weight 299 and has the other of its ends fixed to one end of a link 300, the other end of the link 300 being pivoted to the sprocket 85 by the aforementioned pin 233. Whenever the sprocket 85 revolves through a complete revolution it reciprocates the link 300 which then oscillates the sprocket 291 in such manner that the pawl 292 rides over the cam 295 in a clockwise direction (Fig. 34) and engages the ratchet 290 to rotate it through one-twelfth of a complete revolution, the pawl being retracted to the position wherein it is shown in Fig. 34 at the same time that the sprocket 85 completes its single revolution. Thus, each time the sprocket 85 makes a complete revolution, the pin 289 projecting from the ratchet 290 is moved through an angle of 30°, and therefore it engages the lever 288 once for every twelve revolutions of the shaft 85. When the pin 289 engages the lever 288 it displaces it in a counterclockwise direction (Fig. 34) against the action of the spring 287 and withdraws the cam member 273 from the groove 271, whereupon the Geneva gear member 267 is locked to the gear 277 until it makes a complete revolution and causes the Geneva gear member 266 to rotate through 90°. This rotation of the Geneva gear member 266 is transmitted to the chains 245 through the chains 259 and 253 and is sufficient to advance the trucks passing through the apparatus so that a new stack of plates 133 may be started thereon.

Briefly, the operation of the above described apparatus is substantially as follows: A stack of plates 133 are placed upon the members 44 and green bricks are fed to the belt 75 by any suitable means (not shown) in such manner that the bricks occupy spaced positions upon the belt; it being understood, of course, that the belt 75 is advanced in synchronism with the means which feeds the bricks thereto. When the first brick engages and closes the switch 211 and the following bricks are so positioned that the switch 214 is in its closed position, the solenoid 82 is energized to withdraw its core 81 from engagement with the pawl 78, whereupon the pawl engages the ratchet 63 and the sprocket 85 is caused to make one complete revolution in the manner above described. During this rotation of the sprocket 85 the plate 173 is advanced diagonally across the belt to push eight of the bricks onto one of the plates 133, which plate is advanced with the belt during that period of time the bricks are being transferred from the belt to the plate. Of course, the plate 133 is advanced to the position wherein the bricks may be transferred thereto during previous revolutions of the sprocket 85. After the bricks have been transferred to a plate 133, it is moved into a position wherein it may be engaged by a pair of attachments 125. Then, when the sprocket 85 is caused to make another complete revolution in the manner above described, the attachments 125 will engage the loaded plate 133 and lift it from the members 44, the plate being advanced step by step through subsequent revolutions of the sprocket 85 until it is deposited upon one of the trucks 48, either directly upon the truck or upon a row of bricks previously loaded upon the truck. Each time nine loaded plates are stacked upon a truck, the truck or another truck is advanced to permit the attachments 125 to stack another pile of loaded plates.

Having thus described the invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of the invention; hence it is to be understood that the invention is not limited to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What is claimed as new and desired to be secured by Letters Patent is:

1. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, a plate, means for displacing the articles transversely of the belt onto the plate, and means for advancing the plate laterally and longitudinally while the articles are being transferred thereto.

2. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, plates, means for displacing the articles transversely of the belt onto the plates, means for advancing the plates laterally and longitudinally while they are being loaded, a conveyor, means for transferring the loaded plate to the conveyor, a

truck, said conveyor being adapted to stack said loaded plates on said truck, and means operating in synchronism with said conveyor for advancing the truck intermittently.

3. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, a plate, means for displacing the articles transversely of the belt onto the plate, means for advancing the plate laterally and longitudinally while the articles are being transferred thereto, a conveyor, and means for transferring the loaded plate to the conveyor.

4. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, a plate, means controlled by the articles for transferring them from the belt to the plate, means for advancing the plate laterally and longitudinally while it is being loaded, a truck, and means for placing the loaded plate upon the truck.

5. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, plates, means controlled by the articles for transferring them from the belt to the plates, means for advancing the plates from one side of the belt to the other side thereof, a truck, and means for placing the plates upon the truck.

6. Apparatus of the kind described comprising a traveling belt adapted to receive a plurality of articles, a stack of plates, means for advancing the plates from one side of said stack to the other side thereof, means controlled by the articles for transferring them from the belt to the plates, a truck, means for placing the loaded plates upon the truck, and means for advancing the truck.

7. Material-handling apparatus comprising a traveling belt adapted to receive the material, plates, means for feeding the plates one at the time from one side of the belt to the other side thereof, and means for displacing material transversely of the belt onto the plates.

8. Material-handling apparatus comprising a traveling belt adapted to receive the material, a stack of plates, means for feeding the plates one at the time from one side of the belt to the other side thereof, and means controlled by the material for transferring it from the belt to the plates.

9. Material-handling apparatus comprising a traveling belt adapted to receive the material, plates, means for feeding the plates one at the time transversely of the belt, means for transferring material from the belt to the plates, a truck, and means for automatically loading the plates on the truck.

10. Material-handling apparatus comprising a traveling belt adapted to receive the material, plates, means for feeding the plates one at the time transversely of the belt, means for transferring material from the belt to the plates, a truck, means for loading the loaded plates on the truck, and automatic means for intermittently advancing the truck to arrange the loaded plates in stacks thereon.

11. Material-handling apparatus comprising a traveling belt adapted to receive the material, plates, means for feeding the plates one at the time transversely of the belt, means controlled by the material for transferring it from the belt to the plates, a truck, and means for loading the plates on the truck.

12. Material-handling apparatus comprising a traveling belt adapted to receive the material, plates, means for feeding the plates one at the time transversely of the belt, means controlled by the material for transferring it from the belt to the plates, a truck, means for loading the plates on the truck, and means for advancing the truck.

13. Material-handling apparatus comprising means for feeding plates one at a time into a predetermined position, means for placing material on each plate, means for advancing each loaded plate in turn to a second predetermined position, a truck, means for advancing said loaded plates from said second predetermined position to said truck and arranging them in stacks thereon, means for intermittently advancing the truck to space the stacks, a driven shaft, and means operatively connecting the several above-mentioned means to the driven shaft to cause them to operate in synchronism.

14. Material-handling apparatus comprising a traveling belt, means for advancing plates one at a time into a predetermined position adjacent the belt, means for feeding material carried by the belt onto the plates when said plates are in said predetermined position, means for advancing the plates in the same direction that the belt is traveling, means for advancing each loaded plate in turn to another predetermined position, a truck, means for advancing said loaded plates from said last mentioned predetermined position to said truck and arranging them in stacks thereon, means for advancing the truck to space the stacks thereon, a driven shaft, and means operatively connecting the several above-mentioned means and the belt to the driven shaft to cause them to operate in synchronism.

15. Apparatus of the kind described comprising trucks, means for stacking articles on the trucks, and means including Geneva gears and operating in synchronism with the first-mentioned means for intermittenly advancing the trucks to space the stacks upon the trucks.

16. Apparatus of the kind described comprising trucks, means for stacking articles on the trucks, and automatic means for intermittently advancing the trucks to space the stacks thereon, said advancing means operating in synchronism with said stacking means.

17. Apparatus of the kind described comprising a travelling belt adapted to receive a plurality of articles, a stack of plates posi-

tioned to one side of the belt, means for advancing the plates one by one from one side of the belt to the other side thereof, means for transferring said articles from said belt to said plates, means for advancing said plates in the same direction said belt is travelling while said articles are being transferred thereto, a truck, means operating in synchronism with said travelling belt for intermittently advancing said truck, and means for stacking said loaded plates upon said truck.

18. Apparatus of the kind described comprising a travelling belt adapted to receive a plurality of articles, plates, means controlled by the articles for transferring them from the belt to the plates, a truck, means for intermittently advancing the truck to stack the loaded plates thereon, and power driven means for driving said belt, said transferring means and said advancing means in synchronism.

19. Apparatus of the kind described comprising a travelling belt adapted to receive a plurality of articles, plates, means controlled by the articles for transferring them from the belt to the plates, means for advancing the plates while the articles are being transferred thereto, a truck, means for placing the loaded plates upon the truck, means for intermittently advancing the truck to stack the loaded plates thereon, and power driven means for driving said belt, said transferring means and said truck advancing means in synchronism.

In testimony whereof, I have hereunto signed my name.

ANNA G. KING,
Administratrix of the Estate of Roy D. King, Deceased.