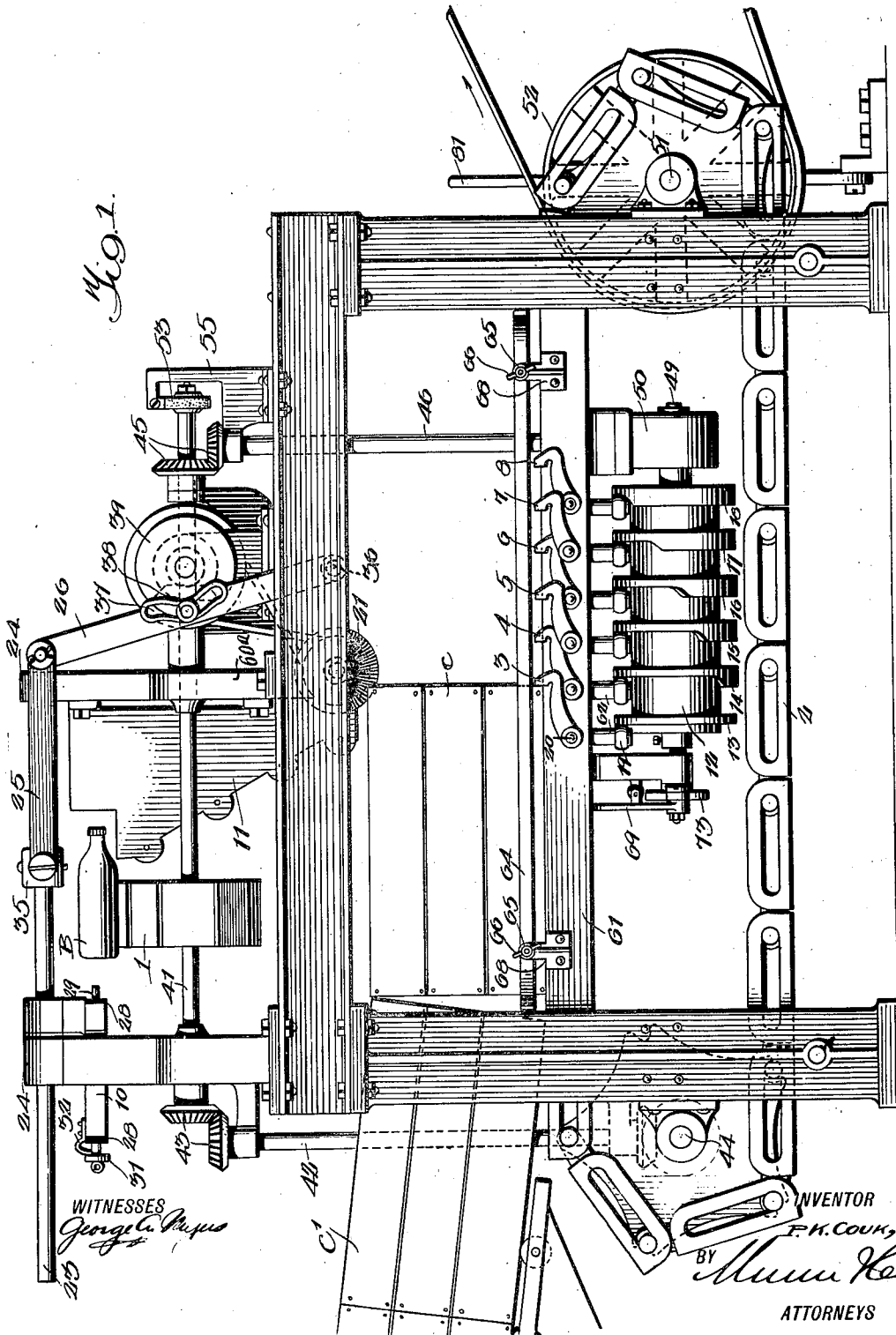


P. K. COUK.
BOTTLE CRATING MACHINE.
APPLICATION FILED MAR. 16, 1921.

Patented Jan. 31, 1922.

6 SHEETS—SHEET 1.

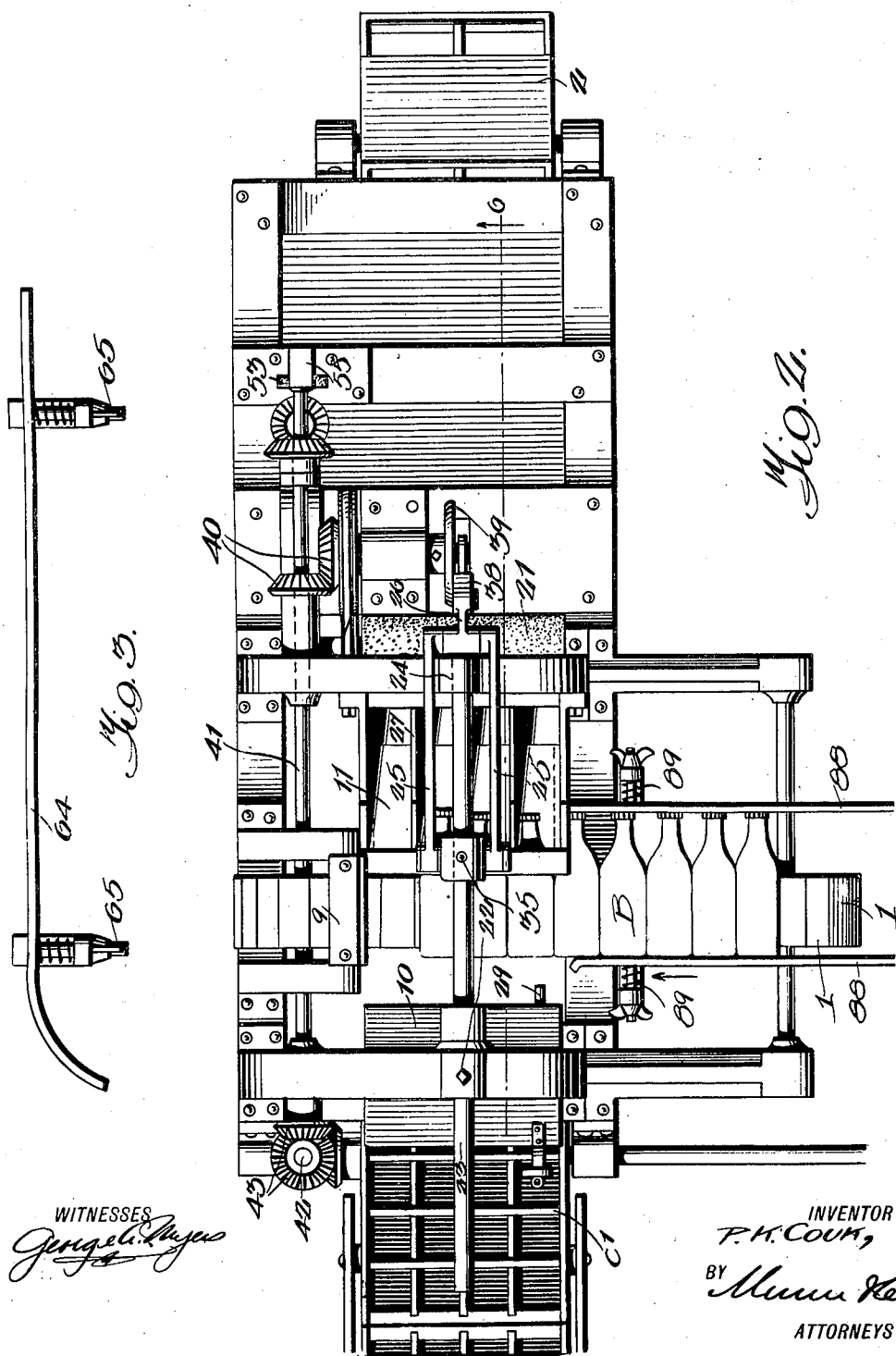
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6 SHEETS—SHEET 2.

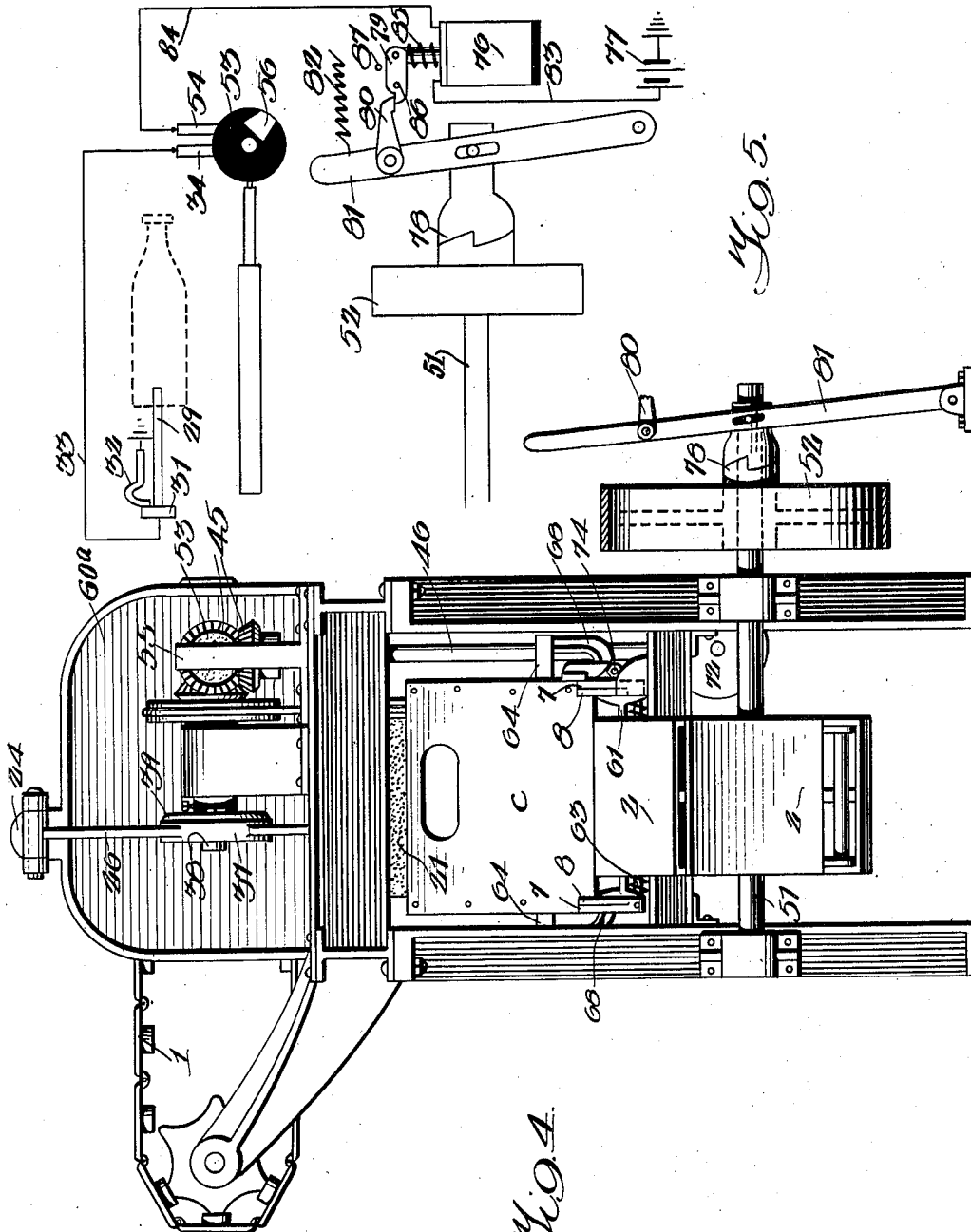


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6 SHEETS—SHEET 3.



WITNESSES
George C. Myers

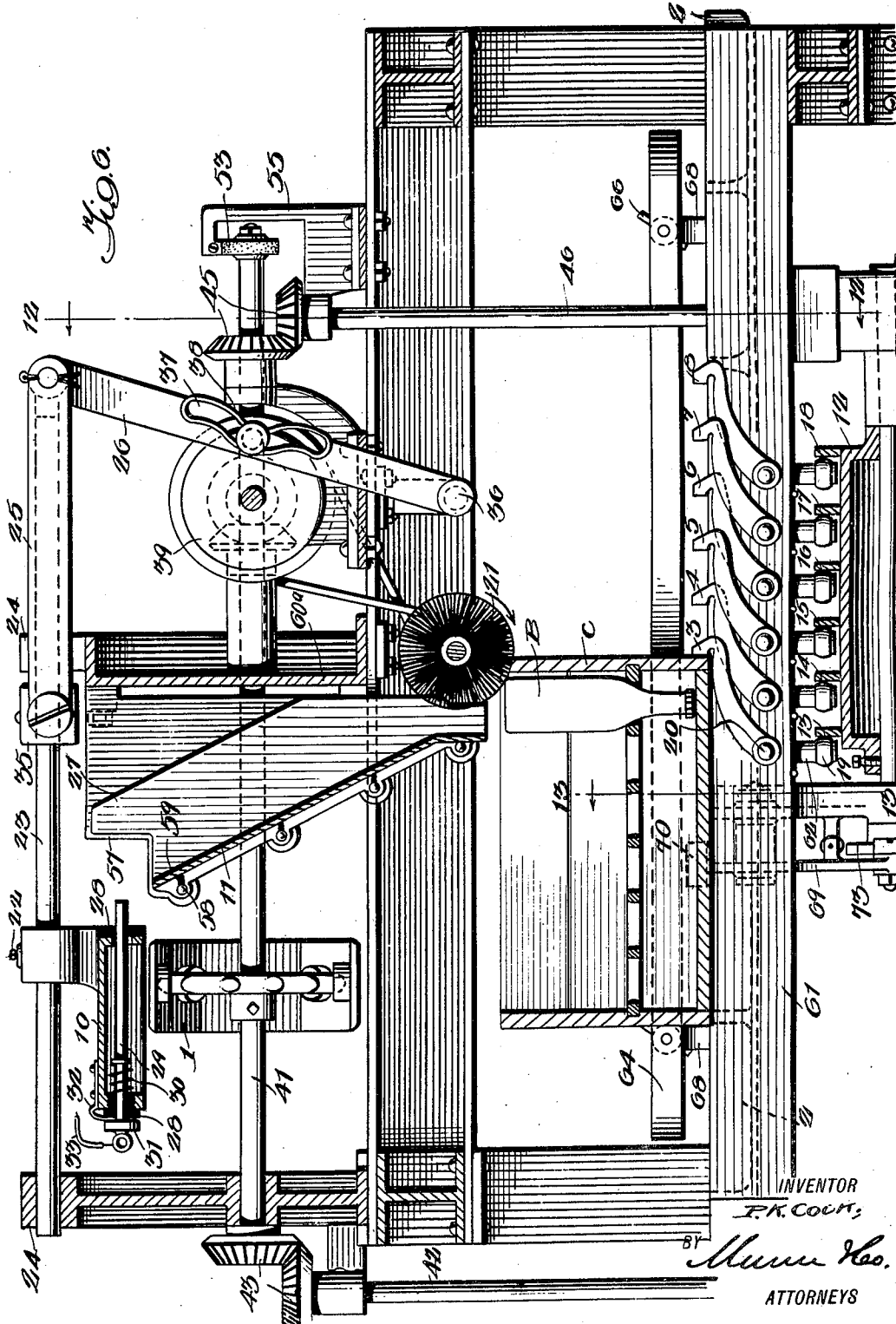
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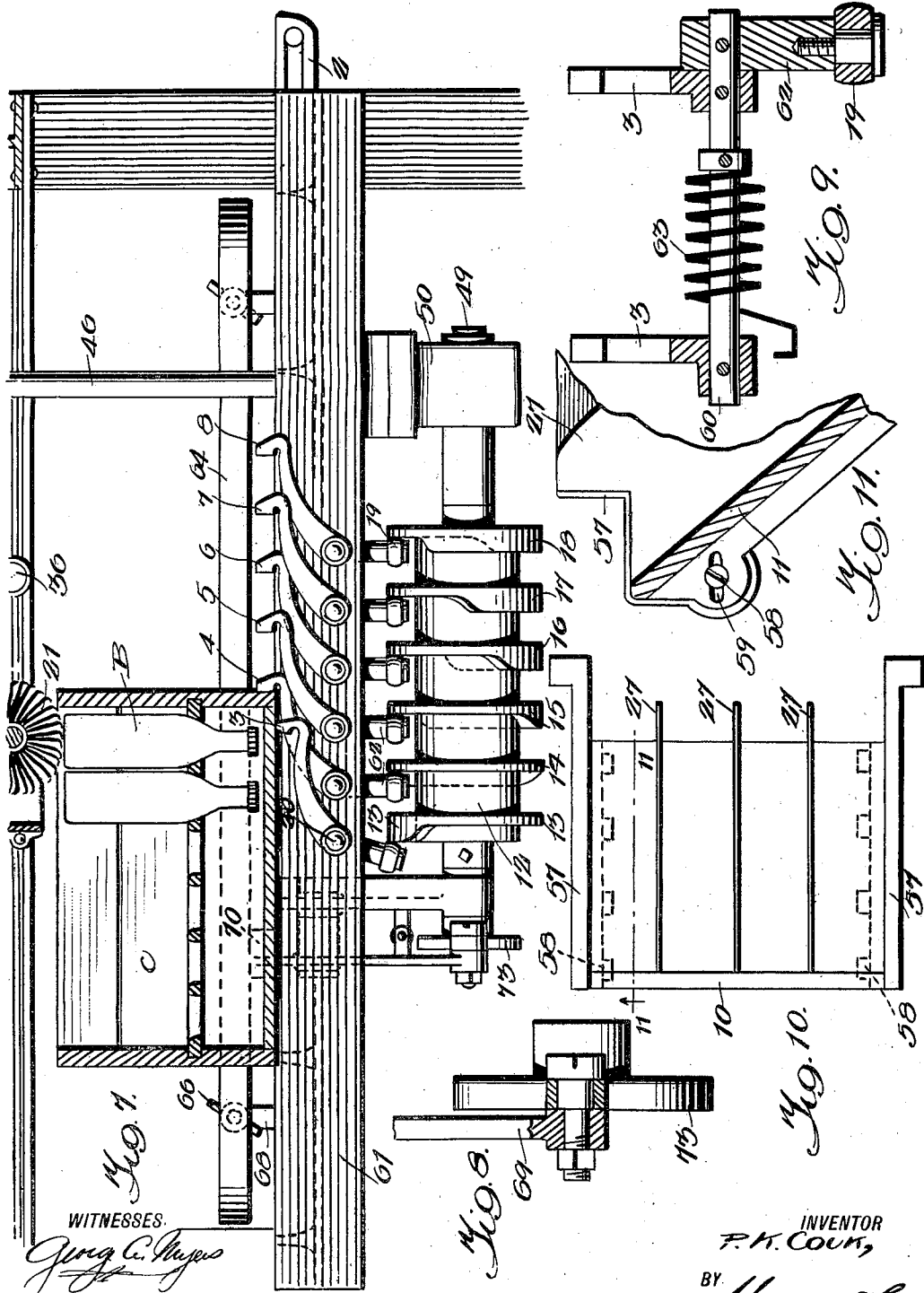


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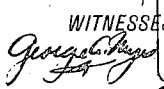
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6 SHEETS—SHEET 5.



1,405,102.

6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

PATRICK KEMPTON COUK, OF ROANOKE, VIRGINIA.

BOTTLE-CRATING MACHINE.

1,405,102.

Specification of Letters Patent.

Patented Jan. 31, 1922.

Application filed March 16, 1921. Serial No. 452,741.

To all whom it may concern:

Be it known that I, PATRICK KEMPTON COUK, a citizen of the United States, and a resident of Roanoke, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Bottle-Crating Machines, of which the following is a specification.

My invention relates to improvements in bottle crating machines, and it consists in the constructions, combinations and mode of operation herein described and claimed.

One of the foremost objects of the invention is to provide a machine for placing bottles of any of the ordinary shapes into a sub-divided crate or container, either ends up or down.

A further object of the invention is to provide a bottle crating machine which advances a crate step by step so as to receive a charge of bottles at each step until the sub-divisions are all filled.

Another object of the invention is to provide means for automatically stopping the machine in case that less than the requisite number of bottles has moved into the position to be pushed into the crate.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:

Figure 1 is a side elevation of the improved bottle crating machine,

Figure 2 is a plan view,

Figure 3 is a detail plan view of one of the crate guides,

Figure 4 is an elevation of the machine looking from the drive end,

Figure 5 is a diagram of the automatic stop mechanism,

Figure 6 is a section on the line 6—6 of Figure 2, showing the crate against the first pair of dogs,

Figure 7 is a detail section, somewhat on the order of Figure 6, showing the crate as having advanced to the second pair of dogs,

Figure 8 is a detail sectional view illustrating the roller mounting on the presser lever,

Figure 9 is a sectional view showing the construction of one of the pairs of dogs,

Figure 10 is a detail plan view of the bottle chute,

Figure 11 is a detail sectional view on the

line 11—11 of Figure 10, showing how the chute can be adjusted,

Figure 12 is a cross section on the line 12—12 of Figure 6,

Figure 13 is a detail cross section on the line 13—13 of Figure 6,

Figure 14 is a section taken on the line 14—14 of Figure 13, showing how the box presser lever is mounted, and

Figure 15 is a detail plan view of the box presser lever.

The general construction and mode of operation may readily be followed in Figures 1, 2 and 6. The machine is arranged to receive a line of bottles B directly from the capping or corking machine, and push off a predetermined number of them (four in the present instance) into the compartment transversely of a crate C which is waiting to receive them.

The bottles B are brought into the machine in recumbent positions on the endless carrier 1. The crates C, C' etc. are moved into the machine by the link belt 2. The link belt moves continuously but each crate is stopped at six successive stages by dogs 3, 4, 5, 6, 7 and 8. The line of bottles B stop moving when the foremost bottle reaches the stop 9 in Figure 2; the carrier 1, however, continues to move beneath the bottles.

At the proper time in the operation of the machine, the pusher 10 moves toward the right and shoves four bottles off of the carrier 1 into the chute 11, the bottles then falling top down into the crate C in waiting against the first pair of dogs 3. The bottles B continue to come until the vacant space on the carrier, this side of the stop 9, is filled, by which time the pusher 10 will again shove off four bottles into the next transverse row of partitions in the crate C.

This requires that the crate C shall have moved up one step, or into engagement with the second pair of dogs 4. There is a drum 12 with cams 13, 14, 15, 16, 17 and 18 for depressing the pairs of dogs in succession. The parts are so timed that after four bottles have been discharged into the first row of compartments in the crate, the cam 13 will ride beneath the roller 19 of the dogs 3, rocking them on the fulcrum 20 and enabling the link belt 2 to carry the crate against the next pair of dogs 4.

Provision is made for retarding the fall of

the bottles into the crate. The circular brush 21 rotates in the direction of the arrow, and occupies enough of the outlet of the chute 11 to restrict the passage and produce a yielding barrier which the bottles must pass in entering the crate, thereby sufficiently retarding the downward movement to prevent breaking. Since the brush 21 rotates continuously and its bristles strike the bottoms of the bottles thereby holding the bottles in the upright positions, it follows that the crate of bottles will come out of the machine with the bottoms all clean. The details of construction shall now be considered separately. Take first the pusher 10. This consists of a hollow rectangular frame, fastened at 22 to the push rod 23 which is reciprocated in its bearings 24 by push links 25, these in turn being connected to the rocker 26. The pusher 10 is substantially as wide as four bottles laid together side by side, and when these bottles are in position against the stop 9, the pusher 10 moves toward the right and shoves all four into the chute 11, the respective bottles going down the various compartments in the chute, these defined by the sheet steel partitions 27.

Insulating pieces 28 support the stop pin 29. This pin controls an electric circuit so as to stop the machine should there be less than the requisite number of bottles ahead of the pusher 10 when the latter makes a movement toward the right. The pin is kept pressed toward the right by a spring 30. It has a contact head 31 at the left which normally engages the spring contact 32. This contact is grounded by virtue of being secured on top of the pusher. A wire 33 runs from the left end of the pin 29 to a brush 34. The left ends of the push links 25 are pivoted to a yoke 35 on the push rod. The rocker 26 is pivoted at 36 to any convenient part of the frame. The rocker is provided with a slot or way 37 of a peculiar formation. The wrist pin 38 of the crank disk 39 works in this slot. The formation of the slot is such that it produces a slow pushing movement of the pusher 10 in operating toward the right, but produces a quick return in operating the pusher toward the left. It also produces an idle period at the extreme left hand part of its stroke, thereby giving ample time for the movement of the four bottles to their position against stop 9 and crate to move to the next set of dogs.

A train of gears by which the crank disk 39 is driven, comprises members 40, one of which is on the shaft 41, through which the carrier 1 is continuously driven. Driving motion for that shaft is derived from the counter shaft 42 with its gears 43, the counter shaft being driven from the driven shaft 44 of the link belt. The cam drum 12 is driven from the shaft 41 by gears 45 and the counter shaft 46.

At the lower end of the countershaft 46 there is a worm pinion 47 which meshes with and drives the worm gear 48 on the cam drum shaft 49. The worm gear and pinion are housed in a casing 50 which is shown in Figure 1, but the gears themselves are disclosed in Figure 12. Driving motion for the whole machine is derived from the driving shaft 51 of the link belt, that shaft carrying the drive pulley 52 which may be clutched in and out by the electric control which is governed by the stop pin 29, referred to above.

At the extreme right end of the shaft 41 there is a commutator 53 which also plays a part in controlling the stop motion of the machine. The brushes 54 and 54 bear on the face of this commutator. They are supported by a bracket 55 which includes a part in which the counter shaft 46 has bearing. The commutator includes a brass insert 56 which is intended to complete a circuit when it bridges the brushes. Consider now the chute 11, into which the rows of bottles are discharged by the pusher 10. The partitions 27 have been described as being made of sheet steel. Any other suitable material will do. They are fixed on the bottom of the chute, but that bottom is movable in respect to the sides 57. The sizes of the bottles may vary slightly, that is to say, bottles of varying sizes may be run through the machine at different times.

Then it may become necessary to adjust the chute to accommodate the different sizes of bottles, and this is done by unloosening the bolts or screws 58 and adjusting the chute accordingly, the lateral flanges of the bottom being provided with slots 59 for the purpose. The part 60^a of the frame forms the right wall of the chute, and it is beneath this wall that the brush 21 operates as clearly shown in Figure 6. The brush is driven from the counter shaft on which the crank disk 39 is fixed.

The crate dogs are arranged in pairs 3—3, 4—4, etc., but since they are identical in construction the description of one will suffice for all. Attention is directed to Figure 9. The dogs 3—3 are fastened near the extremities of the rod 60 on which they are mounted, the rod in turn having bearings in parts of the horizontal I-beam 61 along which the upper strand of the link belt 2 moves. Adjacent pairs of dogs are disposed in overlapping arrangement as shown in Figures 1 and 12, this being for the purpose of providing room for them all.

On the inner end of each rod 60 there is a depending arm 62 which carries a roller as already described under the general operation. It is this roller that bears against the adjacent cam 13 on the drum 12 and pressure for this purpose is furnished by the spring 63, the ends of which are respectively

fastened to the rod and frame. The cams 13, 14, etc., are disposed in different positions on the drum 12 so as to engage the rollers 19, etc. in succession and consequently

5 trip the dogs 3 etc. in succession.

Figure 1 shows the crate C in position against the first pair of dogs. After a row of four bottles has been discharged into the crate bottom up, the first cam 13 then comes

10 around to trip the first pair of dogs 3 so that the crate C may advance to the next pair 4 where it stops until another row of four bottles is discharged.

Guides 64 keep the crates C, C' in place

15 on the I-beam 61. These are flared at the left end so as to facilitate the entrance of the crate. Each guide carries a screw stud 65 as shown in Figures 3 and 13, on which the wing nuts 66 are threaded. Springs 67 are

20 for making ready adjustment of the guides 64 and to take up inequalities or projections of the crates without injury to the guides. Adjustments for tension in the springs are made by turning the wing nuts

25 in one direction or the other.

A lever 69 presses each crate against the guide 64 nearest the observer in Figure 1, each time a new crate moves down into position in readiness to be filled. This lever has

30 a head 70 which engages the next crate and presses it over against the guides 64 on the far side, as the first crate clears the dogs 8—8, and provides clearance between the crates C and C' so that the first pair of the dogs 3—3 may rise into position to stop the advancing second crate. To further these purposes, the clearance head 70 is made in the peculiar shape shown in Figure 15.

A spring 71 pulls the roller 72 of the

The electric circuit embraces the solenoid 76, there being a battery 77 to supply current. Normally, the clutch 78 is "in" and consequently the drive pulley 52 may drive the shaft 51 and other parts of the machine. 70

The trip 79 provides an abutment for the dog 80, and when the dog 80 is in the engagement with the trip 79 shown in Figure 5, the clutch lever 81 is held in the left position against the tension of the spring 82. 75

Assume now that there are only three bottles ahead of the pusher 10 and the pusher begins making a pushing stroke. The stop pin 29 will project into the space that ought to be occupied by a bottle, but since there is no bottle there, the contact 31—32 will be maintained. At approximately the same time, the insert 56 will move around to bridge the brushes 34—54, thereby completing the following circuit: Current flows from the battery 77 over wire 83 to the solenoid 76, over wire 84, past brushes 34—54, wire 33 to contacts 31—32, to ground, and thus back to the negative pole of the battery. The consequent energization of the solenoid moves the core down against the tension of the spring 85, rocking the trip 79 on its fulcrum 86, turning the dog 80 up, and this dog when loose will enable the spring 82 to move the lever 81 toward the right and thus disengage the clutch 78. A stop 87 limits the upward movement of the trip 79 and the core of the solenoid. The operator pushes the lever 81 back to reset the clutch and dog. 80

No mention has been made before of the frame, with the exception of one or two instances where immediate parts of the frame were described in connection with some part of the apparatus, but it may here be stated that any suitable design of frame will serve the purpose of supporting the various operating parts of the mechanism. Mention may also be made that the line of bottles B is guided in the same manner as the crates are guided. For this purpose there are guides 88 (shown in Figure 2) which are mounted at 89 so that adjustments for tension can readily be made. 85

While the construction and arrangement of the improved bottle crating machine, as herein described and claimed, is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims. 110

I claim:

1. A bottle crating machine, comprising a continuously moving bottle carrier, means for advancing a crate step by step beneath the carrier, means for pushing a predetermined number of bottles from the carrier into the crate at each step, and means for preventing the pusher from operating 120

65 completed at the brushes 34—54 by the insert 56.

should less than the prerequisite number of bottles be in place.

2. A bottle crating machine, a continuously moving bottle carrier, a link belt continuously moving beneath the carrier, with means for advancing a crate step by step; common drive means for both the carrier and link belt, means for pushing a predetermined number of bottles from the carrier into the crate at each step, and means for stopping the drive means should less than the prerequisite number of bottles be in position to be pushed.

3. A bottle crating machine, comprising a bottle carrier moving continuously in one direction, a link belt moving continuously in another direction beneath the carrier, means for stopping a crate on the link belt at distances equal to the width of a transverse row of compartments, and means operating above and transversely of the carrier for pushing a predetermined number of bottles into the transverse row of compartments in the crate.

4. A bottle crating machine, comprising a bottle carrier moving continuously in one direction, a link belt moving continuously in another direction beneath the carrier, means for stopping a crate on the link belt at distances equal to the width of a transverse row of compartments, means operating above and transversely of the carrier for pushing a predetermined number of bottles into the transverse row of compartments in the crate, common drive means for the pusher, carrier and link belt, and means associated with the pusher for stopping the drive means after an initial movement of the pusher against less than the prerequisite number of bottles in position on the carrier to be pushed.

5. A bottle crating machine, comprising a bottle carrier, means for pushing bottles from the carrier, a chute for guiding the bottles, a link belt for moving a crate into position beneath the chute to receive the bottles, and a brush rotating in the direction opposite to that of the movement of the bottles to retard the bottles as they pass to the crate.

6. A bottle crating machine, comprising a carrier, means for pushing off a predetermined number of bottles end first, a subdivided chute for guiding the bottles, a link belt advancing a crate into position beneath the chute to receive the bottles, and a brush revolving partly in a portion of the chute and over the crate, to retard the fall of the bottles into the crate and subsequently clean the ends exposed on top.

7. A bottle crating machine, comprising a carrier, means operating across the carrier for pushing bottles off, a link belt moving continuously beneath the carrier at right angles thereto, with means for stopping a

crate at distances equal to the width of a transverse row of compartments; common driving means for the pusher, carrier and belt, including an electric stop mechanism; and electric contact devices carried by the pusher, operating to actuate the stop mechanism when there is less than the prerequisite number of bottles ahead of the pusher on an initial movement.

8. A bottle crating machine, including means for pushing bottles off of a carrier, a crank disk with a wrist pin, and a rocker for reciprocating the pusher, having a slot to receive the wrist pin, formed on a double curve to produce a slow pushing motion of the pusher but a quick returning motion.

9. A bottle crating machine, comprising a continuously moving belt, and means in the path of a crate carried by the belt, successively depressible to cause the crate to advance with a step motion.

10. A bottle crating machine, comprising a continuously moving belt, means in the path of a crate carried by the belt, successively depressible to cause the crate to advance with a step motion, and means for guiding the crate as it passes along with the belt.

11. A bottle crating machine comprising a continuously moving belt, a series of dogs equally spaced apart along a part of the belt, and means for depressing the dogs in succession to produce a step motion of a crate carried by the belt.

12. A bottle crating machine, comprising a continuously moving belt, a series of dogs relatively fixed along a part of the path of the belt to intercept a crate carried by the belt, and a drum with staggered cams arranged to depress the dogs in succession and produce a step motion of the crate along the belt.

13. A bottle crating machine, comprising a continuously moving belt, a series of dogs evenly spaced along the belt, arranged in transverse pairs at the sides of the belt; a continuously moving drum axially parallel with the belt, a series of cams in staggered relationship on the drum, and means extending from the respective pairs of dogs to said cams through which the pairs of dogs are depressed in succession to produce a step motion of a crate advanced by the belt.

14. A bottle crating machine, comprising a continuously moving belt, a series of dogs evenly spaced along the belt, arranged in transverse pairs at the sides of the belt; a continuously moving drum axially parallel with the belt, a series of cams in staggered relationship on the drum; means extending from the respective pairs of dogs to said cams through which the pairs of dogs are depressed in succession to produce a step motion of a crate advanced by the belt, and resilient means for returning each pair of

dogs to the erect position after the cams have passed.

15. A bottle crating machine, comprising a link belt for advancing a crate, means at the sides of the belt for guiding the crate, means successively depressible in respect to which the crate is advanced with a step motion, and means for pushing the crate against one of the guide means, including a head for producing a clearance between two crates enabling the first of the depressible means to rise into the path of the second crate.

16. A bottle crating machine, including a belt advancing crates to be filled, means for guiding the crates, a pivoted presser lever for pressing the crates against one of the guide means, a cam normally holding the lever out of the pressing position, resilient means holding the lever against the cam, and a head included in the lever through which the pressing is done, shaped to produce a space when pressed against a next crate.

17. A bottle crating machine, comprising a carrier, with a shaft by which it is continuously driven; a link belt for advancing crates beneath the carrier, with a main drive shaft from which the belt is driven, stop mechanism associated with the main drive shaft, means for pushing bottles off of the

carrier into a waiting crate, with means by which it is reciprocated from the carrier shaft; a commutator completing part of an electric circuit to the stop mechanism at predetermined reciprocations of the pusher, and a contact device carried by the pusher, opening the circuit when the proper number of bottles is in place, but maintaining the circuit closed when less than the number is in place, to actuate the stop mechanism and stop the machine.

18. A bottle crating machine, comprising a continuously moving carrier, means for pushing a predetermined number of bottles off of the carrier, a subdivided chute for guiding the bottles, and means for adjusting the chute for various sizes of bottles, including fixed side walls, and an inclined bottom with slot and bolt connections with the walls.

19. A bottle crating machine, comprising a base beam, a continuously moving link belt with one strand traveling along the beam to convey a crate, a plurality of stop dogs arranged in transverse pairs along the beam and in overlapping arrangement, and means operating below the beam for depressing the pairs of dogs in succession and producing a step motion of the crate.

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