

April 28, 1931.

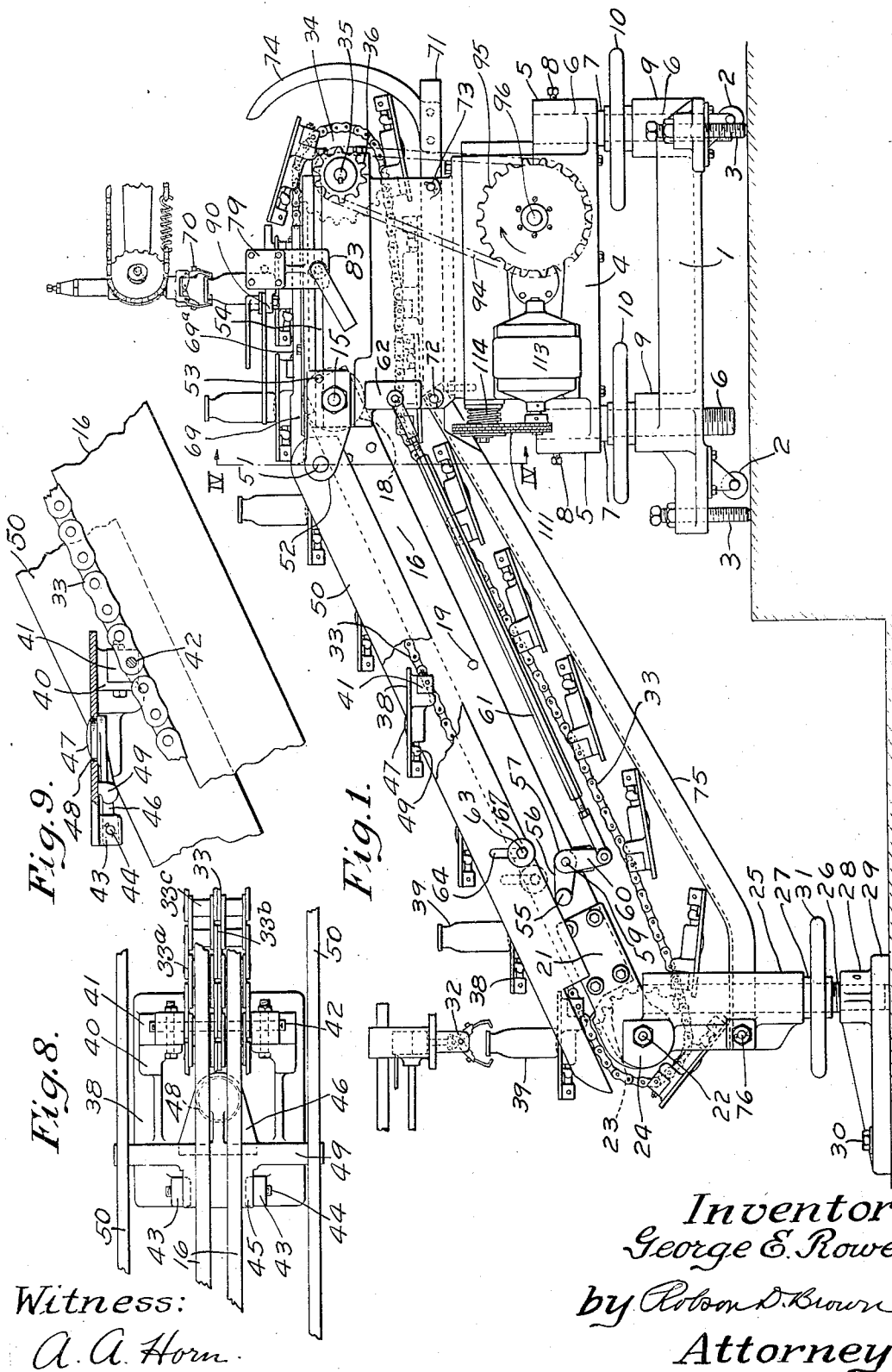
G. E. ROWE

1,802,928

GLASSWARE BUCK

Filed July 29, 1927

4 Sheets-Sheet 1



April 28, 1931.

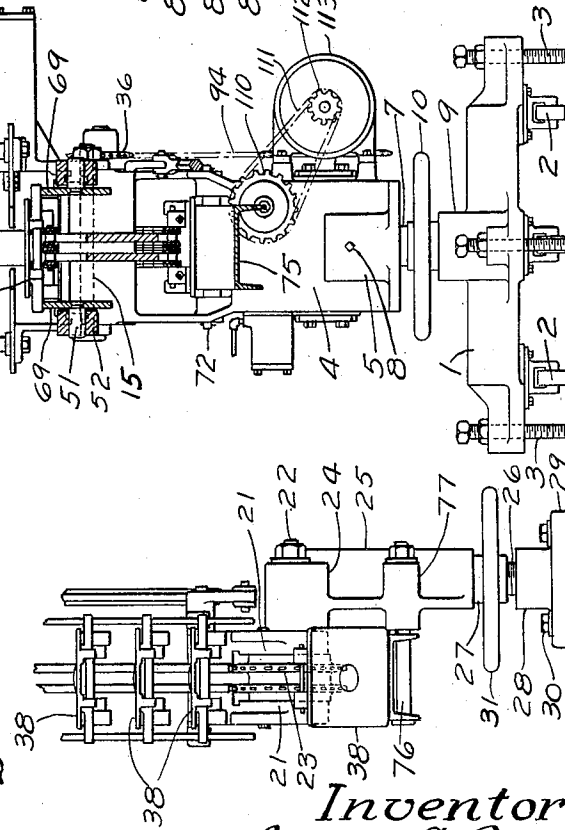
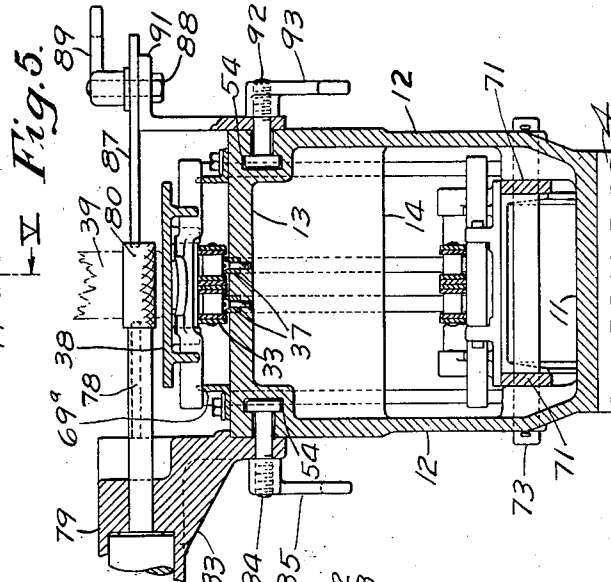
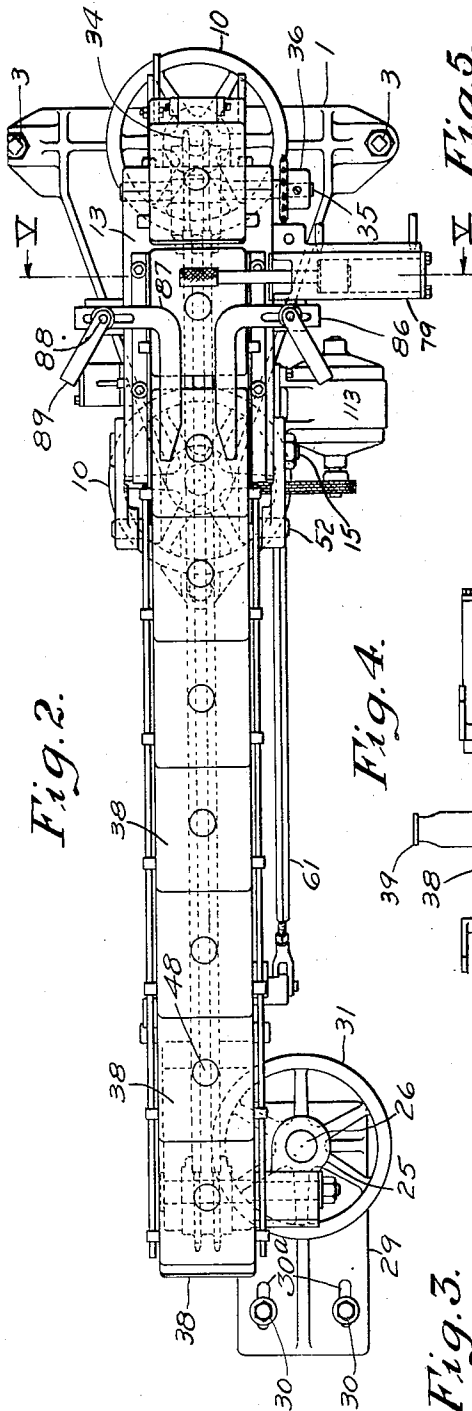
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GLASSWARE BUCK

Filed July 29, 1927

4 Sheets-Sheet 2



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GLASSWARE BUCK

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Fig. 6.

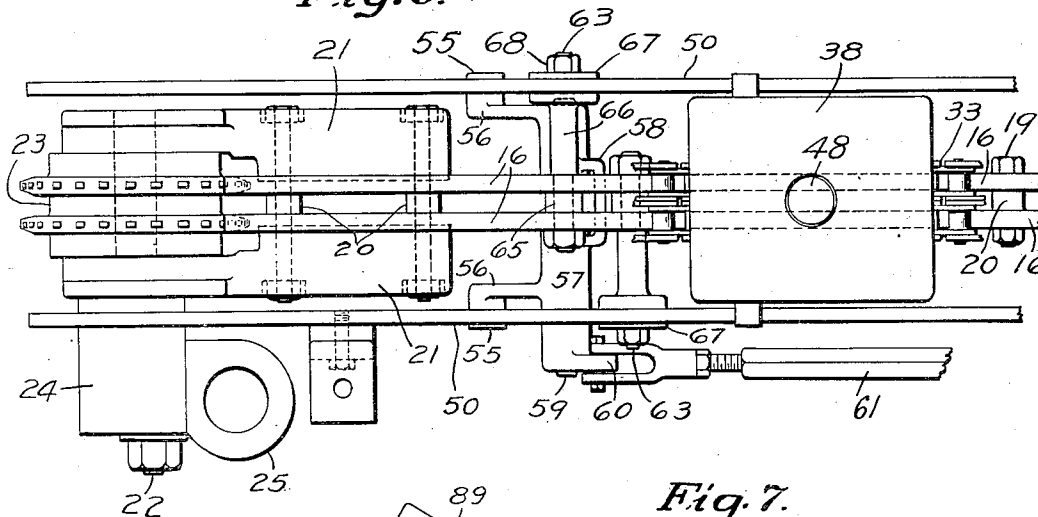


Fig. 7.

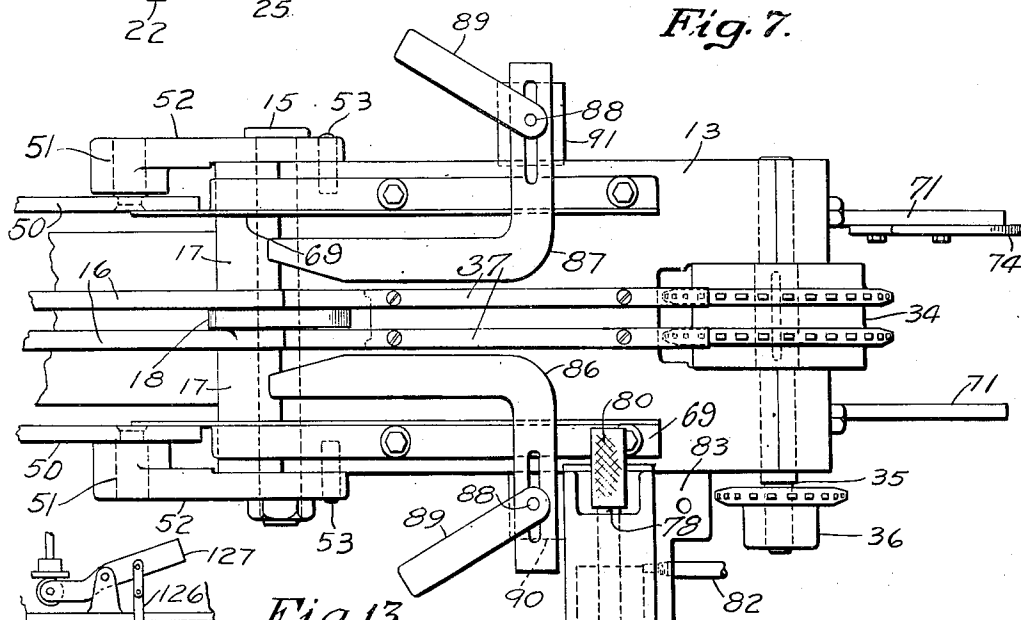
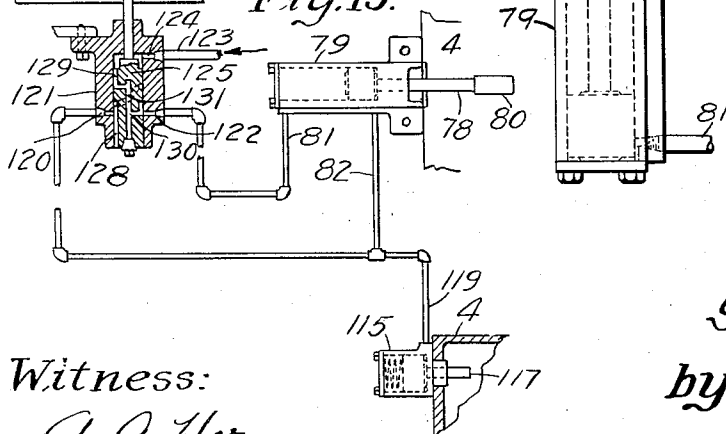


Fig. 13.



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GLASSWARE BUCK

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Fig.10.

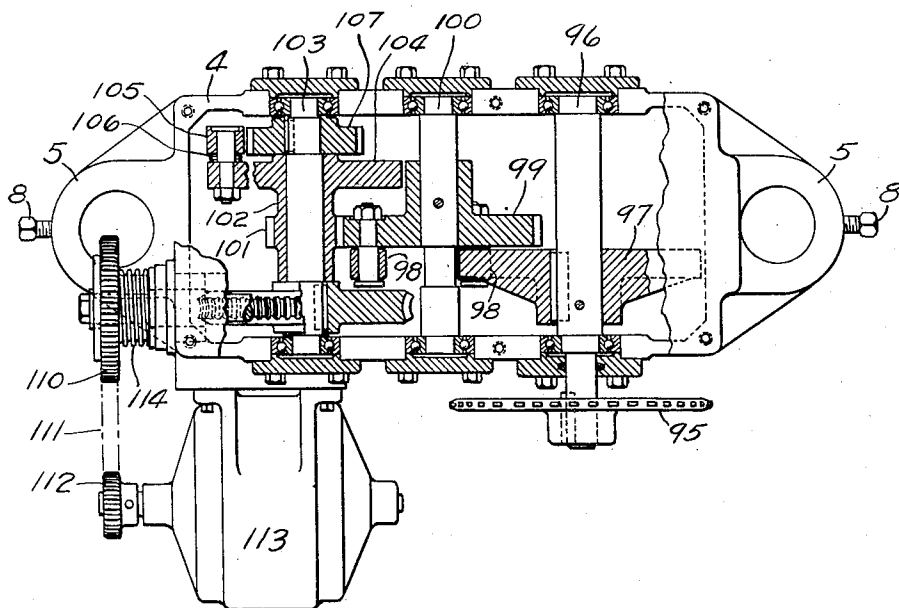


Fig.11.

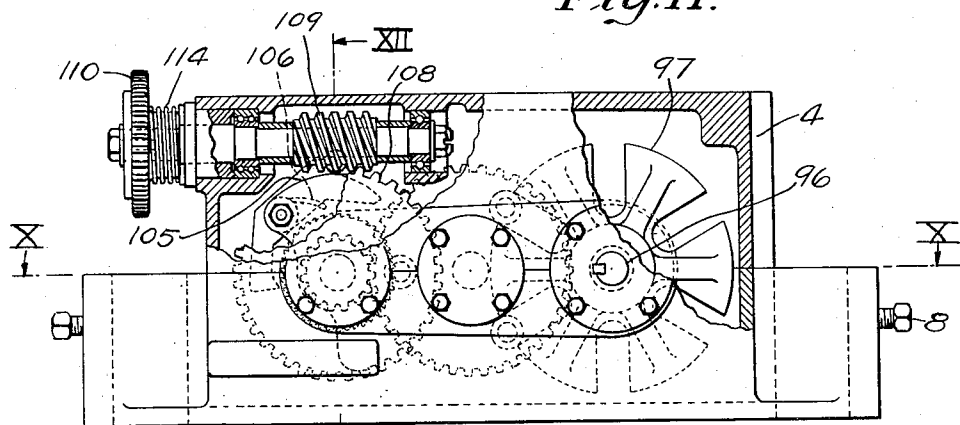
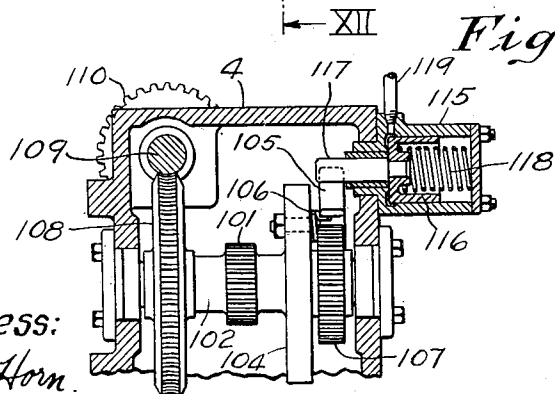


Fig.12.



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UNITED STATES PATENT OFFICE

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GLASSWARE BUCK

Application filed July 29, 1927. Serial No. 209,217.

Bucks are conveying mechanisms which are operatively interposed between glass fabricating machines and the annealing lehrs and which are employed to receive the ware from the take-out device of the fabricating machine and deliver it to the stacker which in turn deposits the ware in proper order or arrangement on the lehr conveyer.

In the case of different characters or types of fabricating machines and lehrs the relation between the levels at which the buck receives the ware and at which it delivers the same varies, and frequently in different installation of like fabricating machines and lehrs the relation between these levels may vary because of the exigencies of factory space, arrangement and the like. Often the level of the lehr is higher than that of the delivery point of the fabricating machine.

Therefore an object which I have in view is the provision of practical means for adjusting the inclination of the path of travel of the platforms or "paddles" upon which the ware is deposited by the take-out device of the fabricating machine and upon which the ware is presented to the stacker.

For this purpose my present invention includes means for varying the angle of inclination to the horizontal of the traction member to which the paddles are connected so that the ware may be received and delivered at the proper levels to insure the proper taking out and presentation to the stacker. Again it is important that the paddles be maintained in a horizontal position while supporting and transporting the ware.

For this purpose my present invention includes means for guiding the paddles which insures their horizontal disposal during their load-bearing travel.

In the preferred embodiment of the principles of my present invention illustrated in the accompanying drawings I have disclosed the paddles pivotally connected to a traction chain and supported in horizontal position by guide means.

It is obvious that when the angle of inclination of the path of movement of the traction member is changed, unless provi-

sion is made to the contrary, the paddles will no longer be horizontally disposed and will thus fail to properly or safely support and carry the ware unless provision is made to that end.

Therefore my present invention includes means whereby the guide means is caused to maintain such relation to the path of the paddles that the latter are supported during their load-bearing travel in a horizontal position regardless of the angle of inclination of the path of such travel.

In the case of bottles, jars and many other characters of ware the bottoms of the same are upwardly concaved and to better support such ware on the moving paddles my present invention may include bottom-supports or "buttons" which fit up into such concavities and which travel with and are movable in relation to the paddles. Such buttons are arranged to drop out of engagement with the ware as the paddles move into position under the pick-up means of the lehr stacker.

My present invention also includes means for guiding the ware into proper alinement with the pick-up means of the stacker.

My present invention also includes means for insuring the halting of the ware in position for the pick-up means of the stacker.

My present invention also includes means for permitting articles or objects which the pick-up has failed to remove from a paddle, such as imperfect ware or broken glass, to be carried off and discharged as cullet.

My present invention provides improved means whereby the rate of delivery of ware by the buck may be regulated.

Inasmuch as it is decidedly advantageous to maintain a speed of movement which will safely transport the ware without danger of toppling it off the paddles I have provided means whereby the speed of movement of the paddles has the same characteristics for each cycle of movement and the rate of delivery is varied by varying the length of the dwells between movements.

My present invention also includes means whereby the rate of delivery by the buck

is synchronized with the operation of the stacker.

Furthermore my present invention provides means whereby the operation of the buck is controlled and actuated by the

Another object which I attain in my present invention is the provision of a compact and portable buck which may be readily moved about the factory and which may be readily adjusted into operative relation with the fabricating machine and Lehr.

In the accompanying drawings, wherein I have illustrated the best embodiment of the principles of my invention now known to me, Fig. 1 is a side elevation of the buck showing a portion of the fabricating machine and also a portion of the stacker which are operatively associated with the buck; Fig. 2 is a plan view of the buck; Fig. 3 is a broken front elevation, looking from the left in Fig. 1; Fig. 4 is a vertical section taken along the line IV—IV in Fig. 1; Fig. 5 is an enlarged vertical section taken along the line V—V in Fig. 2; Fig. 6 is a broken plan view on enlarged scale showing the receiving end of the buck, certain of the parts being omitted for the sake of clearness; Fig. 7 is a similar view of the delivery end of the buck; Fig. 8 is a broken and inverted plan view showing the traction chain, the chain supporting rails, one of the paddles and the guide rails; Fig. 9 is a sectional view taken longitudinally of the structure that is shown inverted in Fig. 8; Fig. 10 is a sectional view taken along the line X—X in Fig. 11; Fig. 11 is a side elevation on enlarged scale of the gear-box partially broken away to show parts; Fig. 12 is a vertical section taken along the line XII—XII in Fig. 11, and Fig. 13 is a diagrammatic view showing the control of the operation of the buck by the stacker.

Referring to the drawings, (Figs. 1 and 4) 1 is a tripodal base provided with the rollers 2 and the leveling screws 3. 4 is the gear box having integrally cast or otherwise provided at its opposite ends the vertically disposed sleeves 5 in which are mounted the upper ends of posts 6, the gear box being supported by the circumferential shoulders 7 on the posts. The posts are fixed in relation to the gear box and against rotation as by the set screws 8. The lower portions of the posts 6 are threaded and passed through openings in the sleeve 9, which sleeves are cast integrally, or otherwise fixed, in relation to the base 1. Interposed between the shoulders 7 and the sleeve 9 are hand wheels 10 having hubs internally threaded to fit the threads of the posts 6. The rotation of the wheels 10 hence raises or lowers the gear box and the structure mounted thereon with respect to the base 1, and the wheels 10 may be individually operated for raising or low-

ering the corresponding end of the gear box 4. It is apparent that the base and gear-box may be properly leveled after the buck is wheeled into proper position.

Mounted on the gear-box 4 is a superstructure or frame comprising the floor 11, the vertical side walls 12, the top or platform 13 and the depending web 14 (see Fig. 5) which serves to stiffen and strengthen the superstructure.

15 represents a pivot bolt which extends transversely of the side walls 12 and on which is pivotally mounted the upper ends of the twin chain-rails 16, (see Fig. 7) the latter being spaced inwardly from the side walls by the sleeve members 17 which may be integral with said side walls and through which the bolt 15 extends. A chain-carrying wheel 18 is rotatably mounted on the bolt 15 between the chain-rails 16.

The chain-rails 16 are held in proper spaced relation intermediate of their lengths by the bolts 19 (Fig. 6) extending through registering holes in the rails and provided with the spacing sleeves 20.

The lower or outer ends of the twin chain-rails 16 have bolted to their outer sides the plates 21 through which extends the bolt 22 upon which, between the plates 21, is mounted the double sprocket 23. The nut-end of the bolt 22 extends through a horizontal collar 24 which is cast integral with the upper end of a vertically disposed stand 25 in the cylindrical bore of which passes a threaded post 26 (Figs. 1 and 3) mounted in a foot piece 29. Interposed between the foot piece 29 and the stand 25 is a hand wheel 31 having a hub internally threaded to fit the threads on the post 26 so that by turning the hand wheel 31 the outer ends of the chain rails may be raised or lowered to properly position the paddles relative to the take-out of the fabricating machine which is indicated at 32 in Fig. 1. Bolts 30 pass through slots 30^a in the foot piece 29 and are fastened into a stationary support. By this construction it is possible to move the foot piece 29 longitudinally when raising or lowering the outer ends of the chain rails in order to provide for the longitudinal component of the movement of the outer ends of the chain rails in moving about the axis 15.

The traction element which moves the paddles 38, hereafter described is shown as a sprocket chain indicated generally at 33. Specifically the chain is shown (Fig. 8) comprising outer series of single links 33^a and intermediate double series of links 33^b, the links being connected by pivot pins upon which are mounted the roller-sleeves 33^c which engage the sprockets and run on the chain rails and on the wheel 18.

The chain 33 at the lower or outer end of the chain-rails 16 runs around the double sprocket 23 (Fig. 1).

The platform 13 (Fig. 7) is recessed at its forward end to provide clearance for the double sprocket 34 which is fixed on a shaft 35 journaled in the side walls 12 of the superstructure. The protruding end of the shaft 35 has keyed thereon a sprocket 36.

As shown in Fig. 7, 37 designates twin rails mounted on the platform 13 and which extend between the ends of the chain rails 16 and the sprocket 34. The rollers of the upper or working strand of the chain run on the rails 16 and 37 and engage the sprockets 23 and 34.

The ware-carrying paddles 38 upon which the ware, indicated by the glass jars 39, is transported, have flat top surfaces, and are provided (Figs. 1, 8 and 9) adjacent to their front ends on their lower surfaces with angular bosses 40 in which are bolted or otherwise secured the bearing blocks 41 in which are journaled the ends of the pivot pin 42 which also serves as the pivot pin of the adjacent chain-links. Thus the paddles are pivotally attached to the chain so as to travel with the latter.

Adjacent to the rear of the paddles the under surface thereof is provided with a pair of spaced and depending lugs 43 through which extend the pivot pin 44 upon which is mounted between the lugs the sleeve 45 which is integral with the forwardly extending lever 46 on the front end of which is carried a "button" 47 which seats in an aperture 48 in the paddle.

Many kinds of glassware are provided with upwardly concaved bottoms and the buttons 47 are designed to fit up into such concavities and aid in securely supporting the ware on the paddles. The buttons are arranged to protrude above the top surfaces of the paddles to the proper degree to engage the concaved bottoms of the ware when the levers 46 bear against the under sides of the paddles.

The lever 46 is provided intermediate its ends with a pair of lateral arms 49 which engage the top edges of a pair of guide-rails 50 to maintain the paddles horizontal during their load-bearing travel as hereafter described.

The guide-rails 50 (Figs. 1 and 7) are hingedly connected at their inner or upper ends to the side walls 12 of the superstructure, the gudgeons 51 of the guide rails being journaled in bearings in the brackets 52 which are secured to the side walls 12 by means of the pivot bolt 15 and which are prevented from rotating on said pivot bolt by their pins 53 which engage the T-slots 54 in the side walls.

The outer ends of the guide rails 50 as is shown clearly in Fig. 6 are supported from beneath by the cylindrical bosses 55 on the ends of the arms 56 which extend radially from the interrupted sleeve-member

57 whose end portions are rigidly connected together by the arched web 58. The sleeve-member 57 is rotatably mounted on a pivot-bolt 59 which extends through the sleeve member and also through aligned holes in the chain-rails 16, the central interruption of the sleeve-member providing clearance for the chain-rails. A spacer sleeve 65 may be mounted on the bolt 59 between the chain-rails 16.

One end of the sleeve member 57 is provided with a third radial arm 60 which is pivotally attached to a connecting rod 61, the other end of which is pivotally connected to a bracket 62 carried by the side walls 12. The pivot on the bracket 62 is so located that parallelism is maintained between the top edges of guide rails 50 and the chain rails 16 irrespective of the slope of the rails. The connecting rod 61 is preferably provided with a screw adjustment, permitting its lengthening or shortening to compensate for any slight errors in the proper positioning of the outer pivot point of the connecting rod 61.

It is obvious that when the stand 25 is raised or lowered through the operation of the hand wheel 31, the outer ends of the rail 16 are moved through a given distance and the rails are given a new inclination.

Save for the provisions above described, such a movement of the support would move the rails 50 through a like distance and hence to an inclination different from that of the chain rails 16 because of the positions of the pivots about which the two sets of rails move. However, by the arrangement above described, the movement of the outer ends of the rails 50 is modified so that the edges of the rails 16 and 50 are constantly parallel.

The paddles 38 are supported upon the rails 16 and 50 while in load bearing position by the pivot pins 42 and arms 49 respectively, and these members are spaced apart a distance equal to that between the pivots 15 and 51, thus the paddles will be maintained in a horizontal position at all slopes of the rails 16 and 50 since the edges of the rails 16 and 50 are constantly parallel.

Means are also provided (Figs. 1 and 6) for assuring maintenance of the guide rails 50 in vertical planes parallel to the vertical planes of the chain rails 16. Thus the bolts 63 extend in opposite directions through the holes in the chain-rails 16 and through the slots 64 in the guide-rails 50, spacing sleeves 65 being mounted on the bolts between the chain-rails. 66 designates longer sleeves mounted on said bolts between each of the chain-rails 16 and the adjacent guide-rails 50, said sleeves 66 having their outer ends headed to serve as washers. Outer washers are designated as 67 and nuts as 68. As the guide-rails 50 are thus constantly guided

between the heads of the sleeve 66 and the outer washers 67, they can be moved only in planes parallel with the planes of the chain-rails.

5 The platform 13 (Figs. 1, 5 and 7) is provided with guide-rails 69 which are alined with the guide-rails 50 so as to be engaged by the arms 49 of the paddles as the latter move off the guide-rails 50.

10 As the paddle approaches and attains its position under the pick-up 70, the arms 49 engage the lowered top-edge portion 69a of said guide-rails 69 (see Figs. 1 and 5) so that the button 47 drops and is thus disengaged from the bottom of the ware, freeing the latter. The rear end of the paddle does not drop but is supported in a horizontal plane by the chain 33 as shown in Fig. 5.

20 71 represents a pair of horizontally disposed rails which are supported on the cross-shafts 72 and 73 above the floor 11 of the superstructure at the proper height to receive and support the inverted paddles as they pass from the sprocket 34. Said rails extend rearwardly of the superstructure and have mounted thereon the twin upwardly and forwardly curved guide bars 74 which receive the paddles and control their inversion as they pass around the sprocket 34.

25 75 represents an inverted channel guide, the front or upper end of which is pivotally supported on the shaft 72 between the rails 71, and the rear end of which is pivotally supported by pivot bolt 76 which extends through a horizontal sleeve 77 integral with the vertical stand 25. The back or lower end of the guide 75 is turned upwardly into substantially a horizontal plane.

40 The inverted paddles move down along the guide 75 and are carried up around the sprocket 23 onto the chain-rails and guide rails already described, halting in turn under the take-out 32 to receive the ware.

45 To insure the halting of the ware in proper vertical alinement under the pick-up 70, I provide a stop 78 which is projected across the path of movement. Said stop is formed by an extension of the piston rod of a fluid-pressure cylinder 79, and it is preferably provided with an asbestos covering 80 to prevent injury to the ware. The stop is projected forward at the proper instant to insure the halting of the ware in the proper position and is then retracted so that an article or object which the pick-up has failed to remove, such as an imperfect piece of ware or broken glass may be carried on by the paddle and dumped into cullet as the paddle is inverted in passing over the sprocket 34.

60 The stop 78 is projected by fluid pressure admitted to the rear end of the cylinder 79 through the pipe 81 and is retracted by fluid pressure admitted to the front end of said cylinder through the pipe 82.

The cylinder 79 is mounted on or preferably cast integrally with a bracket 83 which is slidably mounted on the superstructure and is fixable in position by means of the clamping bolt 84 whose head is engaged in the T-slot 54 of the adjacent wall 12 and which extends through a hole in the bracket. 85 is a lever-nut which may be tightened on the bolt 84 against the bracket 83.

70 The stop may thus be adjusted along the path of the paddles to properly spot the particular character of ware which is being transported to the Lehr.

80 The proper positioning of the ware on the longitudinal axis of the paddles is assured by the guide-bars 86 and 87 whose adjacent contact surfaces are beveled outwardly at the front to insure the engagement of laterally misplaced ware and its proper centering on the paddles.

85 The guide-bars 86 and 87 are angular with their butts extending outwardly and longitudinally slotted to receive the bolts 88 which extend upwardly from the supports of the guide-bars. Thus the guide bars may be adjusted toward and away from the center of the path of movement of the paddles and toward and away from each other to accommodate ware of different diameters or shapes. Lever-nuts 89 are screwed down on the bolts 88 to fix the guide-bars in their adjusted position. The guide-bar 86 is supported on the extension 90 of the cylinder-bracket 83, as shown in Fig. 1 and thus said guide may be adjusted along the path of movement of the paddles with the stop 78.

100 The guide-bar 87 is supported by a bracket 91 slidable in relation to the superstructure in parallelism with the path of movement of the paddle and fixable in position by means of a bolt 92, the head of which is engaged in the T-slot 54 of the adjacent side wall 12 of the superstructure and which extends through a hole in the bracket 91, and a lever-nut 93 which is tightened up on the bolt against the bracket.

110 The paddles are given a step-by-step or intermittent movement, being brought in turn under the take-out 32 of the fabricating machine and under the pick-up 70 of the stacker.

115 Thus the sprocket 36 is connected by a chain 94 with a larger sprocket 95 on the protruding end of a shaft 96 journaled in bearings in the walls of the gear-box 4.

120 97 is the slotted disk of a Geneva drive which is fixed on the shaft 96 within the gear-box 4 and which is engaged by the roller-pins 98 of the other member 99 of the Geneva drive, the member 99 being fixed on a shaft 100 parallel with the shaft 96. The member 99 is provided with a perimetral series of gear-teeth which mesh with a pinion 101 integral with a sleeve 102 free on a shaft 103 parallel with the shafts 96 and 100.

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The sleeve 102 is also provided at one end with a disk 104 which has pivotally mounted on its outer face a pawl 105, the axis of movement of the pawl being intermediate the ends of the pawl. The tooth of the pawl 105 is resiliently pressed by a spring 106 into engagement with the teeth of a ratchet wheel 107 keyed to the shaft 103 adjacent to the disk 104.

The shaft 103 has keyed to it at the other end of the sleeve 102 a worm-gear 108 which meshes with the worm of the shaft 109, the end of which protrudes from the gear-box 4 and has loosely mounted thereon the sprocket 110. The sprocket 110 is connected by a chain 111 with a sprocket 112 on the shaft of an electrical motor 113 which is secured to the side of the gear-box 4. The drive of the sprocket 110 from the shaft 109 is through a friction member against which the sprocket is held by a helical spring 114. In case of overload the drive may slip and prevent breakage.

115 is a single-acting fluid pressure cylinder mounted on the side of the gear-box 4, and 116 is its piston which carries a stop-finger 117 which is arranged to be extended into the box 4 by the helical spring 118 mounted in the rear of the piston 116. The finger 117 is retracted by fluid pressure admitted to the cylinder in front of the piston 116 through a pipe 119.

When the fluid pressure is relieved from in front of the piston 116, the spring 118 extends the finger 117 within the box 4 and causes it to engage the tail of the pawl 105, thus raising the tooth of said pawl out of engagement with the ratchet wheel 107 and thereby interrupting the transmission of rotative power to the sprocket 95. When fluid pressure is admitted through the pipe 119 to the cylinder 115 in front of the piston 116, the latter is forced back, compressing the spring 118 and retracting the finger 117 from engagement with the pawl 105, thus permitting the spring 106 to return the pawl into engagement with the gear 107 and thereby establishing the application of rotative power to the sprocket 95.

The admission and exhaust of air to the cylinder 115 and to the spotter cylinder 79 may be controlled in any well known manner and from any of the associated machinery or from a suitable timing mechanism. In the form illustrated in the drawings, a plunger valve 125 actuated by the movements of the stacker is provided.

The pipe 82 of the cylinder 79 connects with the pipe 119 of the cylinder 115, and the latter pipe is connected to a port 120 in the casing 121 of a piston valve. The pipe 81 of the cylinder 79 is connected to another port 122 of the valve casing 121. A fluid pressure supply pipe 123 is connected to a port 124 in the upper end of the casing

121. 125 is the valve plug arranged for reciprocation in the casing 121.

The lower or outer end of the casing 121 is open to the atmosphere while its upper end is closed except for an axial opening through which extends the stem 126 of the plug 125, which stem is pivotally connected to the lever or moving element 127 of the stacker. It is evident that as the lever 127 moves in one direction the valve plug 125 is lifted in the casing 121, and when the lever is moved in the opposite direction the valve plug is lowered.

The upper end of the valve plug 125 is reduced in diameter so that there will always be fluid pressure in the upper end of the valve casing.

The plug is provided with two vertical slots 128 and 129, which are aligned but not connected. When the valve plug is in its raised position, the slot 128 connects the port 120 to the atmosphere, thus relieving the fluid-pressure from the cylinder 115 and from the front end of the cylinder 79. When the plug is depressed in the valve casing the slot 129 connects the port 120 with the upper end of the casing, thus admitting fluid pressure to the cylinder 115 and to the front end of the cylinder 79.

The valve plug 125 is also provided with a passage 130 which, when the plug is raised, connects the port 122 with the slot 129 and thus admits fluid pressure to the rear end of the cylinder 79. The plug 125 is further provided with a passage 131, shown in dotted lines in Fig. 13, which when the valve plug is depressed connects the port 122 to the slot 128 and thus to the atmosphere, thereby relieving the fluid pressure in the rear end of the cylinder 79.

It is thus apparent that when the valve plug is raised, as shown in Fig. 13, the fluid pressure is relieved from the front end of the cylinder 79 and admitted to its rear end, thus projecting the stop 78 into the path of the ware and insuring the spotting of the article directly under the pick-up 70. Likewise the fluid pressure is relieved from the cylinder 115, thus permitting the spring 118 to extend the finger 117 into engagement with the pawl 105, thus retracting the pawl from engagement with the gear 107 and halting the travel of the paddles.

On the other hand, when the plug 125 is depressed, the fluid pressure is admitted to the front end of the cylinder 79 and relieved from its rear end and the stop 78 is retracted, and further fluid pressure is admitted to the cylinder 115 causing the retraction of the finger 117 and permitting the pawl 105 to reengage the pinion 107, thus imparting travel to the paddles.

Owing to the fact that the pressure in cylinder 115 must overcome the expansive force of the spring 118, the retraction of

the finger 117 is retarded until the stop 78 has been retracted, thus removing the stop 78 from the path of the paddles before the latter resume their travel, so that an im-

perfect or broken article of glass, which the pick-up of the stacker has failed to remove from the paddle, may be dumped into the cullet by the paddle as the latter passes around the sprocket 34.

The stacker has simply been indicated, as in itself it forms no part of the present invention, but its construction and the operation of its pick-up and its lever corresponding to the lever indicated in Fig. 13 of the accompanying drawings are fully shown and described in the application for Letters Patent filed by E. H. Lorenz in the United States Patent Office on July 11, 1927, being Serial Number 204,875 or as published in British Patent No. 293,750, issued to the British Hartford-Fairmont Syndicate, Ltd., assignee of Edward Henry Lorenz. As is pointed out in that patent, the stacker is timed by the glassware feeder. Thus it follows that an interruption in the operation of the feeder and hence of the formation of glassware will be communicated to the stacker and through it to the buck.

As the driving mechanism of the buck, if uncontrolled by the pin 117, would drive the buck in a series of accelerating and decelerating steps separated by zero periods of dwell, and since the projection of the pin 117 into the line of movement of the pawl breaks the driving connection always at the instant of zero motion, and as the pin 117 is withdrawn from such contact at a variable instant controlled by the valve 129, the period of dwell between movements of the conveyor will be varied. In the construction indicated in Figs. 10, 11, 12 and 13 taken in connection with the aforesaid Lorenz application or British patent, it is obvious that provision is made for a variation of the time of retraction of the pin 117, and hence a variation in the length of dwell between movements of the conveyor. Normally, the pin 117 is held in its projected position by the spring 115. When the crank arm carrying the pawl in its rotation arrives at the position of the then projected pin 117, the drive is broken and the conveyor is maintained at the point of zero motion. This condition is maintained until an arm operating the lever 127 picks up a piece of ware, the picking up movement causing a brief communication between the valve passage 129 and the pipe 120 which, putting air into the cylinder 115, retracts the pin 117. This retraction lasts but a brief interval, but long enough to permit a remaking of the pawl and ratchet connection and for the pawl to pass beyond the pin, after which the further movement of the arm 127 re-

verses the position of the valve 129 and permits the spring to promptly return the pin 117 into the path of the pawl where it remains until the pawl again arrives at the proper operative position adjacent thereto, when the operation is repeated. Thus, if the periodicity of the stacker operation be changed, nothing is changed in the operation of the conveyor save the length of the periods of dwell and by this means, and this means alone, the two mechanisms are constantly in the proper synchronism without any variations in gears, star wheels, or timing of the motor or other parts of the conveyor drive.

It will be understood that the lever 127 moves to depress the plug 125 as the pick-up lifts the ware from the paddle, and that the lever 127 moves to raise the valve plug 125 to stop the movement of the paddles at a selected point during the return movement of the stacker arm.

It is thus evident that the control of the operation of the buck by the operation of the stacker is accomplished through the regulation of the dwells between movements of the paddles instead of variations in the speed of such movements. Thus the speed of the motor may be adjusted to impart to the paddles the speed at which the ware may be transported without danger of toppling, and this speed may be maintained, but necessarily the paddles must be moved to the forming machine as rapidly as ware is taken out therefrom.

It is to be noted that the Geneva drive here shown and described differs from the usual Geneva drive in that three driving rolls are provided and arranged so that as one of the rolls completes its work in moving the disk 97 and is withdrawing from the slot therein, another roll is entering another slot and immediately taking up the work of moving the disk. By this arrangement, the alternate accelerating and decelerating movements of the Geneva drive are obtained, which movements are particularly desirable in the movement of the glassware upon the paddles. Were the ordinary Geneva drive employed, the several stepped movements of the disk would necessarily be separated by substantial periods of rest. By the present arrangement, while the character of movement of the usual Geneva drive is retained, the periods of dwell between these movements are reduced to zero, the movement caused by each roll beginning immediately after completion of the movement caused by the preceding roll. This novel driving arrangement is peculiarly desirable in a device such as that above described, in which it is desirable that the period of dwell of the paddles be variable and capable of selection and change without change of the Geneva movement.

What I claim is:—

1. In a glassware buck, the combination of a traction element, ware-supporting paddles connected to said traction element, means for varying the angle of inclination of said traction element to the horizontal, and means effective for a plurality of varying angles of inclination of the traction element for maintaining the paddles in a horizontal position during their load-bearing travel.

2. In a glassware buck, the combination of a traction element, ware-supporting paddles connected to said traction element, means for varying the angle of inclination of said traction element to the horizontal, guide means for said paddles, and connections whereby when the angularity of said traction member is changed said guide means are adjusted to maintain the paddles horizontal during their load-bearing travel.

3. In a glassware buck, the combination of a traction element, ware-supporting paddles connected to said traction element, means for varying the angle of inclination to the horizontal of the traction element, guide means for maintaining the paddles in a horizontal position during their load-bearing travel, and means whereby when the angle of inclination of the traction means is varied said guide means are simultaneously adjusted to maintain the horizontal disposal of the paddles.

4. In a glassware buck the combination of a horizontally disposed platform, a support hingedly connected to said platform and arranged to be disposed at a plurality of different angles to the horizontal, a flexible traction element moving over said support and said platform, ware-supporting paddles connected to said traction element and caused to travel therewith, and means effective at said plurality of angles of said support for maintaining the paddles in a horizontal position while travelling over said support and said platform.

5. In a glassware buck, the combination of a horizontally disposed platform, a support hingedly connected to said platform and arranged to be disposed at an angle to the horizontal, a flexible traction element moving over said support and said platform, ware-supporting paddles connected to said traction element and caused to travel therewith over said support and said platform, means for varying the angularity of said support, and means arranged to be moved in unison with said support and to maintain the paddles horizontal while traveling over said support and said platform.

6. In a glassware buck, the combination of a platform where the removal of the ware occurs, a support hingedly connected to the platform, a foot-member for the

other end of said support, means for varying the effective length of said foot-member, a traction element arranged for travel over said support and platform, and ware-supporting paddles connected to said traction element.

7. In a glassware buck, the combination of a platform where the removal of the ware occurs, a support hingedly connected to the platform, a foot-member for the other end of said support, means for varying the effective length of said foot-member, a traction element arranged for travel over said support and platform, ware-supporting paddles connected to said traction element, and means for leveling the platform.

8. In a glassware buck, the combination of a platform from which the ware is removed, means for picking up the ware at a selected point on the platform, a traction element arranged for travel over said platform, ware-supporting paddles connected to said traction element, a stop member arranged to be extended transversely to the path of travel of said paddles to insure the spotting of the ware at said selected point, and means for extending and retracting said stop member at predetermined intervals.

9. In a glassware buck, the combination of a platform from which the ware is removed for placing in the Lehr, a traction element arranged for travel over said platform, ware-supporting paddles connected to said traction element, a stop member arranged to be extended transversely to the path of travel of said paddles to insure the spotting of the ware in the pick-up position, means for extending and retracting said stop member at predetermined intervals, and means for adjusting the position of said stop member relative to the path of the paddles.

10. In a glassware handling device, the combination of a platform from which the ware is removed, means for picking the ware up at a selected point on the platform, a traction element arranged for travel over said platform, ware-supporting paddles connected to said traction element and brought by the movement of the latter into the pick-up position, and means for spotting the ware at the pick-up position and maintaining it in such position against movement of the paddles.

11. In a glassware buck, the combination of a platform from which the ware is picked up, means for picking up the ware at a selected point on the platform, a traction element arranged for travel over said platform, ware-supporting paddles connected to said traction element and brought by the movement of the latter into the pick-up position, means to stop the ware at the said pick-up position and lateral guides to

insure the centering of the ware on the paddles.

12. In a glassware buck for transporting the ware from a receiving position to a delivery position, the combination of a plurality of ware-supporting paddles having apertures therein, means for causing said paddles to be moved in turn to the delivery position, buttons movably mounted relative to the paddles and guide means for holding the said buttons upwardly within the concaved bottoms of the ware until it approaches the delivery position.

13. In a glassware buck for transporting the ware from a receiving position to a delivery position, the combination of a plurality of ware-supporting paddles having apertures therein, means for causing said paddles to be moved in turn to the delivery position, buttons movably mounted relative to the paddles, guide means for holding said buttons upwardly within the concaved bottoms of the ware until it approaches the delivery position, and means for disengaging the buttons from the ware when the ware is picked-up from the paddles.

14. In a glassware buck, in combination, means for supporting and transporting glassware, means for imparting accelerating and decelerating movements to the transporting means in regular immediately connected cycles, and other means for periodically stopping the movement of the transporting means for selected periods of time between the cycles of its movement while maintaining constant the character of the movement.

15. In a glassware buck, the combination of a traction element arranged for travel, ware supporting paddles connected to said traction element and movable therewith, apertures in said paddles, and means in said apertures adapted for movement to hold the ware in position on the paddles and to release the ware therefrom, means for lifting the last named means into ware holding position during a portion of the path of movement of the traction element, and means for depressing said means to release the ware.

16. In a device for handling glass articles, which are provided with concave bottoms, comprising a traction element adapted to move at an angle to the horizontal during part of its path and horizontally during another portion of its path, ware carrying paddles attached to said traction element, each of said paddles having an aperture therein, a movable button in said aperture adapted to fit in the concavity of the ware, and means for projecting said button into the concave bottoms of the ware during the non-horizontal portion of the travel of the traction element and paddles, and for withdrawing said buttons from the concavities

during horizontal portions of the travel of said traction element.

17. In a device for handling articles, a plurality of article supporting members, each having a forward portion and a rearward portion, a bearing element attached to the forward portion of each and a second bearing element attached to the rearward portion, a rail upon which the first bearing element rides and a second rail upon which the second bearing element rides, the second rail being arranged parallel to the first, means for connecting the article supporting members, means for causing an article transferring motion of the supporting members and the connecting means therefor parallel to the rails, means for varying the inclination of one of the rails to vary the path of movement of the supporting members and means for varying the inclination of the other rail for maintaining the ware supporting members substantially horizontal.

18. In a device for transferring glassware, a plurality of members for supporting the said glassware during the transferring operation, a forward bearing element and a rearward bearing element connected with each of the supporting members, a chain connecting the supporting members, means for imparting motion to the chain to cause a ware transferring movement of the supporting members, an inclined guide rail upon which the forward bearing element rides, a second inclined rail upon which the rearward element rides, means for adjusting the inclination of the guide rails to change the inclination of the path of movement and to maintain the supporting surface of the ware supporting members substantially horizontal.

19. A conveyor comprising article supporting members, means for moving said article supporting members in a path inclined with respect to the horizontal, means for varying the angle of inclination of said path, and means for maintaining said article supporting members horizontal during the load bearing portion of their travel while permitting variations in said angle of inclination of said path.

20. An escalator buck for transferring glassware comprising a plurality of pivotally connected ware supporting members, an inclined rail for supporting said ware supporting members for movement along an inclined path, a rail for controlling the angle from the vertical of the ware supporting surface of the ware supporting members, means for moving the ware supporting members along the inclined path, means for adjusting the first rail to vary the inclination of the path of movement and means for adjusting the second rail to control the angle from the vertical of the ware supporting surfaces of the ware supporting members.

21. An elevating conveyor adapted to operate at any one of a plurality of angles, comprising a conveying surface and means to maintain said surface horizontal at any one of said plurality of angles.

22. A conveyor comprising article supporting members, means for moving said article supporting members over a path inclined with respect to the horizontal and means for maintaining said article supporting members horizontal while permitting variations in the angle of inclination of said path.

23. A conveyor comprising means to move articles from one position to a second position at a higher elevation, and means comprising said first named means to maintain the surface on which said articles are moved substantially horizontal, said means permitting variations in the angle of elevation of the article conveying means.

24. A glassware conveyor adapted to move articles of glassware from a receiving position to a delivery position, comprising a traction element, glassware supporting members connected to said element, means comprising the traction element for moving the ware supporting means from the receiving position to the delivery position, means for varying the angle of inclination to the horizontal of said traction element, and means effective at a plurality of said angles for maintaining the ware supporting means in a horizontal position during their movement from the receiving position to the delivery position.

25. A glassware conveyor comprising a traction element, glassware supporting members connected to said traction element, means for varying the angle of inclination to the horizontal of a portion of said traction element, means for maintaining in a constant horizontal position another portion of said traction element, and means for maintaining the ware supporting members in a horizontal position effective at any of a plurality of said angles of inclination.

26. A glassware conveyor comprising a traction element, means defining a path over which said traction element travels, one portion of said path being horizontal, the second portion of said path being inclined to the horizontal, means for varying the angle of inclination to the horizontal of the second portion of said path, glassware supporting members connected to said traction element, and means for maintaining in a constant horizontal position said ware supporting members at a plurality of said angles of inclination of said path.

27. A glassware conveyor comprising an endless traction element, glassware supporting members connected to said traction element, means for varying the angle of inclination to the horizontal of a portion of said

traction element, means for maintaining in a constant horizontal position another portion of said traction element, means to move said traction element from the inclined position to the horizontal position, glassware supporting members connected to said traction element, and means to maintain said glassware supporting members in a horizontal position at any of a plurality of angles of inclination of the traction element and at the horizontal position thereof.

28. In a glassware conveyor adapted to transport articles of glassware from a receiving position to a higher removal position, the combination of a platform having a horizontal upper surface, a support upon which ware is received hinged to said platform, means to dispose said support at a plurality of angles to the horizontal, a traction element, ware supporting members connected to said traction element, means to move said traction element over said support and said platform, and means including said traction element effective at a plurality of said angles for maintaining said ware supporting members in a horizontal position while travelling over said support and said surface of said platform.

29. In a glassware handling device, the combination of a platform, a support pivoted to said platform and arranged to be disposed at any one of a plurality of angles below the horizontal, a flexible traction element, means to move the traction element over said support and said platform, ware supporting members connected to said traction element, and means effective at any of said angles of said support for maintaining the ware supporting members in a horizontal position while over said support.

30. A glassware handling device comprising a horizontal platform, a support, means for pivoting one end of said support to said platform, means for moving articles of glassware over said platform and said support, a foot member attached to the other end of said support at a right angle to said platform, means for varying the effective length of said foot member, and means for levelling said platform, whereby said platform may be maintained at all times in a horizontal position and said support may be declined at a plurality of different angles to said platform.

31. A glassware handling device comprising a platform from which ware is picked up, means for moving the ware to the platform, a stop member, means to extend and retract said stop member transversely of the path of travel of said glassware conveying means at predetermined intervals, and means to pick up the ware.

32. A glassware handling device comprising a platform from which glassware is removed, a traction element adapted to travel

over said platform, were supporting members connected to said traction element, a stop member, means to extend and retract said stop member at predetermined intervals transversely of the path of travel of said ware supporting members to stop said ware at a selected point, and means for picking up the ware from said selected point.

33. In a glassware handling device, the combination of a platform, means for transporting ware to a position above said platform, means for picking up the ware from said position, and means for defining the position comprising a stop member arranged to be extended transversely across the path of said ware transporting means; and members for guiding the ware extending parallel longitudinally to the path of said ware transporting means.

34. A glassware handling device comprising a platform, means to move articles of glassware from a position lower than said platform to the platform, a stop member adapted to be extended across the path of movement of said article moving means, and means for varying the position of said stop member relative to said path.

35. In a glassware conveyor, the combination of a platform, a traction element arranged for travelling on said platform, ware supporting elements connected to said traction element, a stop member adjacent to said platform, means to extend and to retract said stop member at predetermined intervals transversely of the path of travel of said elements, and means for adjusting the position of said stop member relative to the path of said elements.

36. In combination, a glassware handling device comprising a platform from which ware is removed, a traction element adapted to travel over said platform, ware supporting members connected to said traction element for movement therewith, and means for positioning the ware at a selected position on said platform, said means maintaining the ware in such position against movement of the ware supporting members; and means for picking up the ware from said member at said selected position.

37. A glassware handling device comprising a platform from which ware is picked up, means to transport glassware to and on said platform, means to stop the travel of glassware across said platform, means acting in conjunction with said last named means to define a point at which the ware is stopped, and means to pick up ware from said point.

38. In a glassware handling device, a platform, means for transporting ware from a position below said platform to a point thereabove, means for positioning the ware at a predetermined point above said plat-

form, and means for removing the ware from said predetermined point.

39. A glassware handling device comprising a platform from which ware is picked up, an endless traction element arranged to travel over and off said platform, ware supporting paddles connected to said element, means for positioning the ware at a selected point on said platform for a predetermined period, means for picking up the ware at said selected point, and means for reversing the direction of travel of said traction element at a point beyond said pick-up point, said last named means being adapted to allow articles of glassware not picked up to be dumped from said paddles.

40. A glassware handling device comprising an endless traction element, ware supporting members attached to said traction element, a platform over which said traction element and ware supporting members travel while bearing ware, means for positioning ware at a selected point relative to said platform, means for removing ware from said selected point, means for positioning said platform relative to said removal means, said removal means being adapted to remove articles of a definite height, means for moving said positioning means to allow ware not removed to pass from said selected point, and means to dump such unremoved ware from said ware supporting members.

41. In an article handling device adapted to transport articles having concavities from a receiving position to a delivery position, the combination of a plurality of article supporting members having apertures therein, means for causing said members to be moved in turn from the receiving position to the delivery position, buttons movably mounted relative to said members, and guide means for holding said buttons upwardly within said concavities until said buttons approach the delivery position.

42. A handling device adapted to transport articles having concavities from a receiving position to a delivery position, comprising a plurality of article supporting members, apertures in said members, means for moving said members in turn to said delivery position, buttons mounted movably relative to said members, and guide means for holding said buttons upwardly within said concavities until the buttons approach said delivery position, said means terminating before the ware reaches said delivery position, whereby the buttons are disengaged from the articles.

43. A glassware handling device comprising a stacker adapted to operate in regular periodical cycles the length of which may be varied from time to time, a conveyor, an independent drive for said conveyor to carry articles to a position at which they may be received by the stacker, and means

operated by the stacker and variable with said stacker for regulating the travel of the conveyor.

44. A glassware handling device comprising a stacker adapted to operate in regular periodical cycles the length of which may be varied from time to time, a conveyor, an independent drive for said conveyor to carry articles to a position at which they may be received by the stacker, and means directly controlled by the stacker at a selected time in each cycle of the stacker movement for regulating the travel of the conveyor by controlling the periods of dwell thereof.

45. The combination of a stacker and a glassware conveyor comprising a plurality of ware supporting members, means for causing immediately connected alternating accelerated and decelerated movements of said members, and means timed by the operation of said stacker for regulating the travel of said members by imposing a halt between the decelerated and the accelerated movements.

46. In combination, a stacker and a glassware conveyor, said conveyor comprising a plurality of ware supporting paddles, means for causing a step-by-step movement of said paddles with a period of zero dwell between said steps, and means controlled by said stacker for increasing said dwell upwardly from zero.

47. In association with a glassware stacker, a conveyor comprising an endless chain, a plurality of paddles mounted on said chain, means to impart an accelerating and decelerating movement to said chain, the accelerating movement immediately following the decelerating movement, and means for interrupting said movements at the instant of variation.

48. A glassware conveyor comprising a traction element, ware bearing members on said traction element, means for imposing an alternating immediately connected accelerating and decelerating movement to said traction element, and means for imposing a halt in the movement of said traction element at the end of the decelerating movement.

Signed at Hartford, Conn., this 26th day of July, 1927.

GEORGE E. ROWE.