April 25, 1933. E. H. LORENZ 1,905,476

APPARATUS FOR HANDLING GLASSWARE

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Fig. 1.

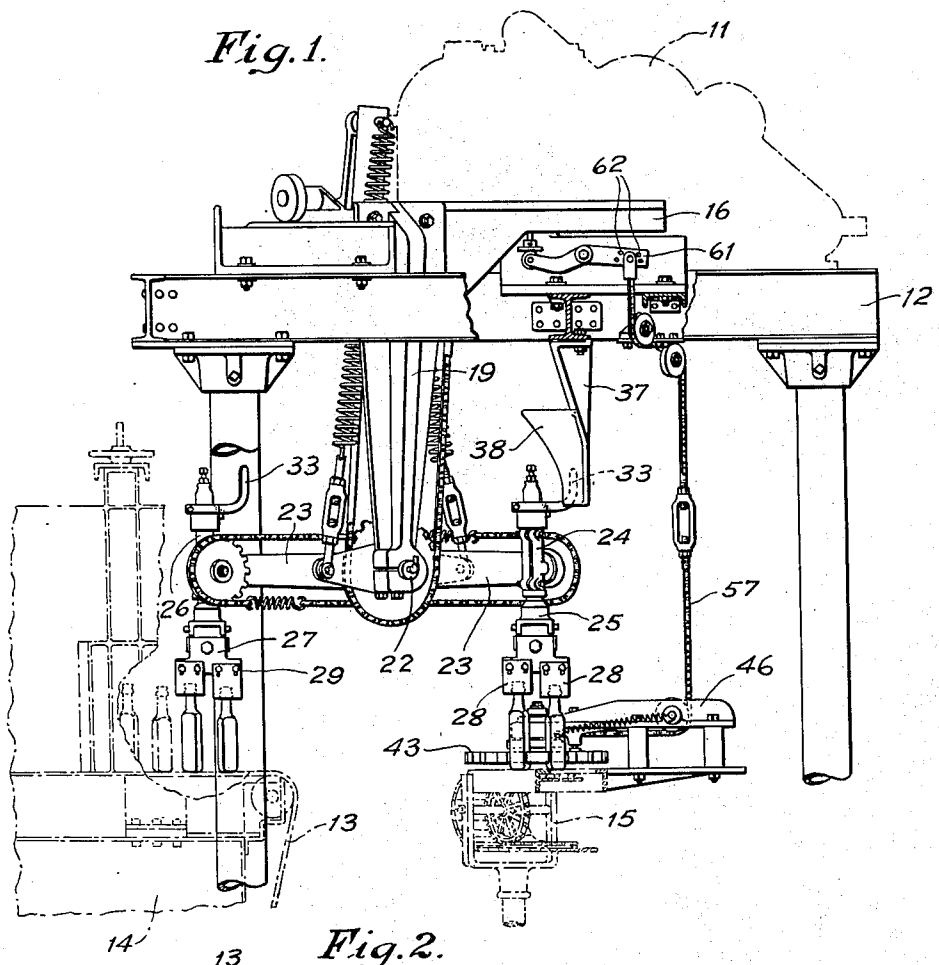
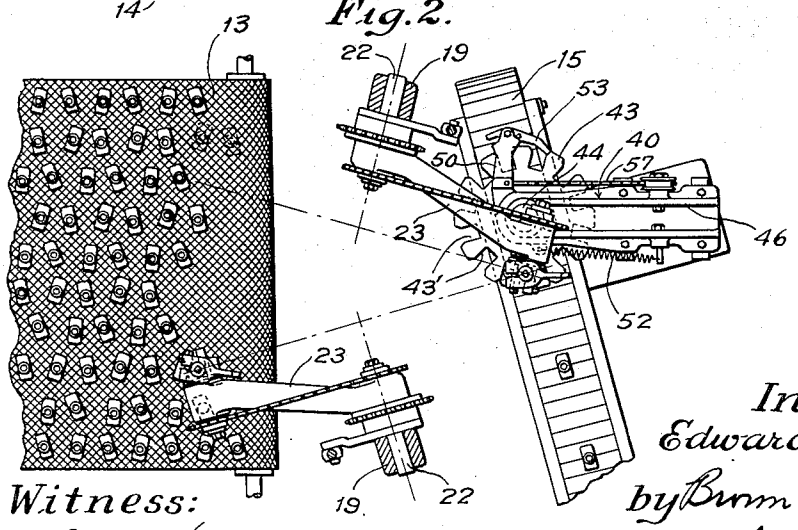


Fig. 2.



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Fig.3.

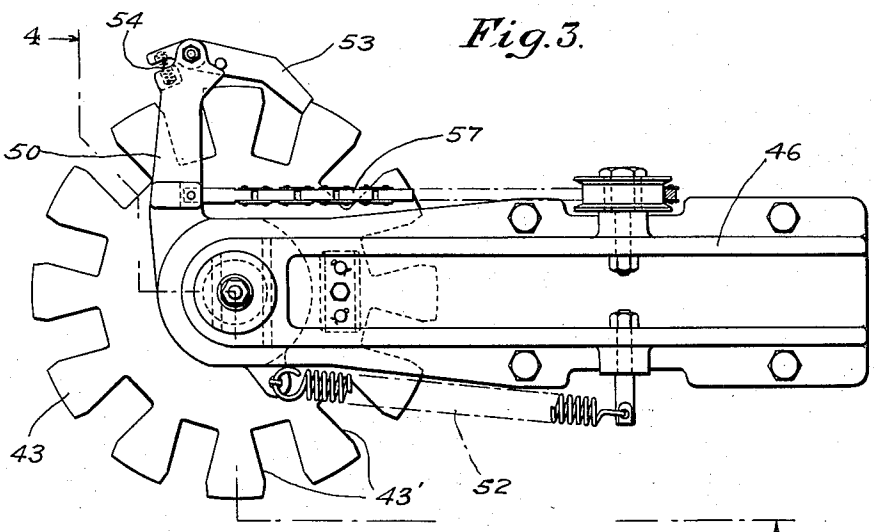


Fig.4.

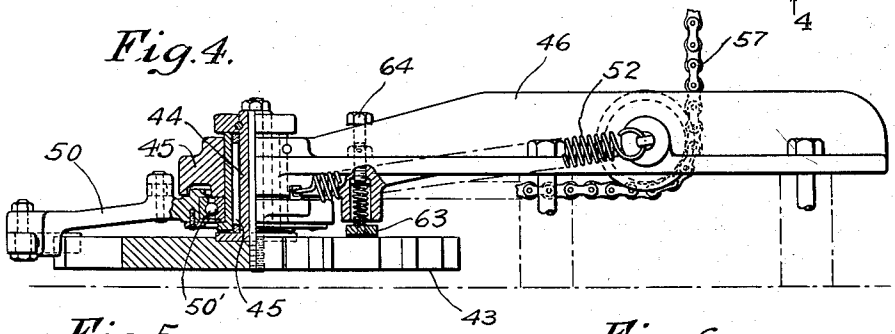


Fig.5.

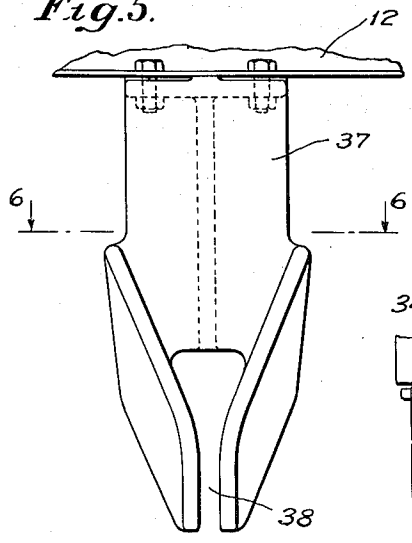
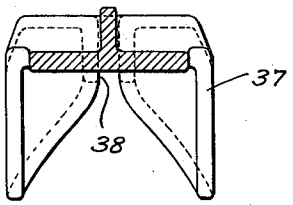


Fig.6.



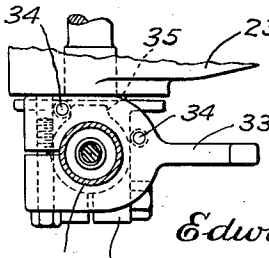


Fig.7.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR HANDLING GLASSWARE

Application filed July 24, 1931. Serial No. 552,865.

This invention relates to apparatus for handling articles of glassware and more particularly relates to glassware handling apparatus adapted to pick up successive groups of articles from one position and to deposit successive groups at a plurality of different positions.

This invention is an improvement upon and addition to the invention of my copending application, Serial No. 204,875, filed July 11, 1927, in which is disclosed a structure now known commercially as the "Hartford-Empire mechanical stacker", to which application reference is made for such details as are not described herein. The present case may thus be considered as a continuation in part of my said copending application. Such stacker is also fully shown and described in Australian Patent No. 10,932, Dec. 16, 1927, and also in British Patent 293,750, completely accepted Dec. 20, 1928.

Said stacker is adapted to place single articles of glassware arriving on an endless conveyor at a position at which they are picked up successively by two alternating tongs, each tongs mechanism depositing the article picked up by it at a position different from that at which it deposited a preceding article.

The illustrated embodiment of the present invention, while retaining most of the mechanism of the said "mechanical stacker", is adapted to place a group of articles delivered successively by a conveyor at a position at which the groups are picked up successively by two alternating tongs mechanisms, each tongs mechanism depositing the group picked up by it at a position different from that at which it deposited a preceding group.

It is an object of my invention to increase the capacity of the aforementioned mechanical stacker without increasing the speed thereof.

A further object is to provide means for positioning each of a plurality of articles of ware at a receiving position and delivering each group of articles at different delivery positions.

Other objects of my invention will be apparent from the following description and from the drawings, in which

Figure 1 is a side elevation showing the complete mechanism with certain parts thereof, which may be identical with the aforesaid Mechanical Stacker, diagrammatically illustrated;

Fig. 2 is a plan view of the positioning mechanism in association with a conveyor, a lehr belt, and the tong-carrying arms;

Fig. 3 is an enlarged plan view of the spotter wheel and its actuating mechanism;

Fig. 4 is a view partly in vertical section on the lines 4—4 of Fig. 3 and partly in elevation with a portion broken away and in section;

Fig. 5 is a front elevation of the tongs positioning mechanism;

Fig. 6 is a horizontal section on the line 6—6 of Fig. 5; and

Fig. 7 is a detail view of the tongs mechanism mounting.

Referring particularly to Fig. 1, the embodiment of my invention herein described comprises a stacker mechanism 11 mounted upon a support 12 in position adjacent to a conveyor belt 13 of a lehr 14 and over an endless conveyor 15. The stacker comprises a suitable frame 16 pivoted for oscillating movement on the support 12. From the frame 16 depends a pair of arms 19. Suitably mounted about a horizontal pivot pin 22 on each of the depending arms 19 is an oscillating arm 23, the outer end of which carries in a split bearing 24 a tongs holding and actuating mechanism 25.

By locating on a common vertical axis the center of oscillation of the frame 16 and the ware receiving position, while having arms 19 of proper length to bring the centers of the tongs into the said axis to pick up the ware, the tongs always return to the same receiving position regardless of the extent of oscillation of the frame or arm about the vertical axis.

The parts thus far described, the mechanism for oscillating the arms 23 about horizontal and vertical axes, and the means for maintaining the tongs-holding and actuating mechanisms vertical, are described in de-

tail in my above-mentioned application, and will not further be described herein except as modified by the present invention.

The tongs holding and actuating mechanisms comprise a barrel 26 mounted for oscillation about its vertical axis, to the lower end of which are attached plates 27 adapted to be moved toward and away from each other by a piston, spring and air motor arrangement contained in the barrel 26, which may be identical with the tong opening and closing mechanism of the said mechanical stacker. Adjustably connected to the plates are tong fingers 28 adapted for vertical adjustment by means of slot and bolt connections 29. As will be obvious from Fig. 1, each pair of tong fingers may be adjusted relatively to each other to handle ware of different heights.

A tongs positioning member 33 is attached to the upper end of the barrel 26 and forms a collar thereabout, which collar rests upon the upper surface of the split bearing 24, in which the barrel 26 is loosely held. Two pins 34 are mounted in the upper surface of the bearing 24 and coact with a stop member 35 to limit the oscillations of the barrel (Fig. 7).

Depending from the support 12 is a guideway 37 mounted above and slightly to one side of the receiving position and so shaped that the positioning member 33, when carried by the swinging arm 23 to the receiving position, will be forced into a slot 38 therein to turn the barrel and position the tong fingers 28 directly over the ware to be picked up, regardless of the angle to which the arms have been turned when the frame 16 is oscillated about its vertical axis. Preferably, the mounting of the barrel is sufficiently tight that the positive impulse of the guideway is necessary to effect oscillation of the barrel and tongs.

In order to position the ware at the position from which it is to be removed by the tongs, I provide a spotting mechanism, indicated generally at 40 (Fig. 2), cooperating with the endless conveyor 15 and with the stacker mechanism.

Articles of ware previously aligned by any preferred means (not shown) on the conveyor 15 are carried by the movement of the conveyor into pockets 43′ of a ratchet wheel 43 mounted to intercept the articles of ware as they are moved by the conveyor. The ratchet wheel 43 is fixed on a vertical shaft 44 mounted in a bearing 45 on a frame 46 which is carried by the supporting structure of the conveyor 15. The ratchet wheel is so positioned relative to the tongs mechanism that when the wheel is in a position of rest one pocket is in alignment with each one of the tongs and, without any movement, provides a positioning means solely by its cooperation with the moving conveyor. The distance between the centers of the pockets is equal to the distance between the centers of a pair of tongs so that by a movement of the ratchet wheel sufficient to bring a succeeding pocket into proper position to stop an article of ware, the preceding pocket with ware carried thereby wil be moved to the pick-up position for that article of ware.

The ratchet wheel 43 is turned by a pawl 53 pivoted intermediate its ends on one end of a pawl arm 50. The pawl arm is mounted intermediate its ends on bearings 50′ in a raceway formed in the arm and on the frame 46, the axis of oscillation of the arm being in axial alignment with the shaft 44 of the ratchet wheel 43.

In order to swing the pawl arm in a clockwise direction, it is attached intermediate the pawl carrying end and its pivot to a chain 57 to one end of a rocker arm 61 which is rocked once for each complete oscillation of each of the swinging arms 23. The rocker arm may be moved by any preferred means but preferably is actuated in the manner shown and described in my above-referred to application. The movement of the pawl arm in a counter-clockwise direction is accomplished by a tension spring 52, one end of which is affixed to the frame 46 and the other end of which is attached to the end of the pawl arm 50 opposite to the pawl-carrying end. An extension spring 54 mounted between one end of the pawl arm 50 and the pawl 53 maintains the pawl against the ratchet wheel 43.

As will be obvious from a consideration of Fig. 1, numerous holes 62 are provided for varying the distance of movement of the chain 57, so that for ware of various sizes the throw of the wheel may be changed. Obviously for ware of greatly different sizes various sized spotting wheels may be provided, and these may be very easily interchanged with the mechanism shown.

In order to eliminate over-running and lost motion in the spotter wheel, I provide a spring pressed plunger 63 mounted in the frame 46 to bear against the upper face of the wheel. The tension of the spring of the spring pressed plunger may be adjusted as indicated in Fig. 4 by the adjusting bolt 64.

In operation, the endless conveyor 15 carries one of a plurality of bottles which have previously been properly aligned thereon into a pocket of the spotter wheel 43. This pocket at its position of rest is in alignment with one of the tongs mechanisms 28. Upon the removal of one of the swinging arms 23 toward the pick-up or receiving position, the lever 61 is moved to index the wheel one turn through the chain 57 and the pawl arrangement 50, and the first bottle is carried beneath the position to be picked up by the second of the two tongs mechanism 28, and a second bottle arrives at the position previously occupied by the first bottle. Thus two bottles are

positioned in a proper location to be gripped by the tongs mechanism. The bottles are then grasped by the tongs; the arm 23 swings to deliver the articles to the delivery position; and while swinging the frame 16, is indexed to deliver the bottles to one side of the position at which the preceding bottles were delivered by that arm. The other arm 23, returning while the first arm is delivering ware, obviously will not have its tongs in proper alignment to pick up ware placed by the spotting wheel, due to the oscillation or indexing of the frame 16, until the guide 33 enters the guideway 37 and until the barrel 26 is turned to its proper position by the cooperation of the guide and guideway to align the tongs 28 with the receiving positions.

It will be obvious that numerous changes and modifications may be made in the above-described embodiment of my invention without departing from the scope thereof as defined in the following claims:

I claim as my invention:

1. Apparatus for handling glassware, comprising the combination with a transfer arm having tongs mounted thereon for engaging an article of ware at a single receiving position and releasing it at any one of a plurality of laterally spaced delivery positions, and means for mounting said tongs for angular movement with respect to said arm about a vertical axis, of cam means and cam follower means, one of which is stationarily located adjacent to at least one of said positions and the other of which is located to move with said tongs, for indexing said tongs with respect to said arm to the desired extent about said vertical axis.

2. Apparatus for handling glassware, comprising the combination with a transfer arm having tongs mounted thereon for engaging an article of ware at a single receiving position and releasing it at any one of a plurality of laterally spaced delivery positions, and means for mounting said tongs for angular movement with respect to said arm about a vertical axis, of means including a member not partaking of the transferring movement of the tongs for presenting the tongs always in a single predetermined relation to said receiving position at the time they are in readiness to engage a glass article at that position.

3. Apparatus for handling glassware, comprising the combination with a transfer arm having tongs mounted thereon for engaging an article of ware at a single receiving position and releasing it at any one of a plurality of laterally spaced delivery positions, and means for mounting said tongs for angular movement with respect to said arm above a vertical axis, of means for positioning the tongs with respect to the arm angularly about said vertical axis to insure that the tongs are always in a single predetermined relation to said receiving position at the time they are in readiness to engage a glass article at that position, the last-named means including stationary cam means located adjacent to said receiving position, and cam follower means associated with said tongs, the parts being so arranged that the idle or return movement of said arm in moving said tongs from any one of the delivery to the receiving positions is effective to cause the engagement of the cam follower means with the cam means to index said tongs with respect to said arm any necesary amount to present the tongs always at the said angular relation to said receiving position.

4. Apparatus for handling glassware, comprising the combination with a transfer arm having a tongs carrying member thereon which is adapted to be moved by movement of said arm between a single receiving position and any one of a plurality of laterally spaced delivery positions, means for mounting said tongs-carrying member for angular movement with respect to said arm about a vertical axis, and means for positioning a plurality of glass articles at predetermined points at said receiving position, of plural tongs associated with said tongs-carrying member for simultaneously gripping a plurality of glass articles, and means including a member not partaking of the transferring movement of the tongs for presenting said tongs carrying member always in a predetermined angular relation to said receiving position about said vertical axis at the time said tongs are in readiness to engage said plurality of articles at their predetermined points at said receiving position.

5. Apparatus for handling glassware, comprising the combination with a transfer arm having a tongs-carrying member thereon which is adapted to be moved by movement of said arm between a single receiving position and any one of a plurality of laterally spaced delivery positions, means for mounting said tongs-carrying member for angular movement with respect to said arm about a vertical axis, and means adapted to be moved in synchronism with the movement of said arm for positioning a plurality of glass articles at predetermined points at said receiving position, of a plurality of tongs carried by said tongs-carrying member for simultaneously gripping a corresponding number of glass articles, an arm extending from said tongs-carrying member, and cam means located adjacent to said receiving position for cooperation with the last named arm, the arrangement of the parts being such that return movement of the first named arm and said tongs-carrying member from any one of the delivery positions to the receiving position will cause the engagement of the second-named arm with said cam means and thereby will cause said tongs to be indexed to any necessary extent with respect to the first-named arm to cause the tongs to arrive at

the ware receiving position in a predetermined relation thereto so as to be in exact position to grip the plurality of articles which at that time are positioned at their respective predetermined points at said receiving position.

6. Apparatus for transferring articles of glassware from a conveyor by which the articles are carried in single file onto the conveyor belt of a glassware annealing lehr, comprising the combination with a stationary support, a movable support pivoted to said stationary support on a vertical axis which, if extended, would pass substantially through a ware-receiving position on said buck or conveyor, a bracket depending from said movable support, a transfer arm pivoted to said bracket on a horizontal axis and arranged for oscillatory movement through substantially 180° about said horizontal axis, a tongs-carrying member pivoted to said arm on a horizontal axis spaced from the first-named horizontal axis, means for mounting said tongs-carrying member for movement with respect to said arm also about a vertical axis, the length of said arm being such that the last-named vertical axis is substantially in vertical alignment with the vertical axis pivot between said stationary support and said movable support when said tongs-carrying member is at said ware-receiving position, and a spotter member positioned adjacent to said buck or conveyor and adapted to position a plurality of articles thereon preparatory to the transfer of such articles from the buck or conveyor to the conveyor belt of the glass annealing lehr, of a plurality of tongs carried by said tongs-carrying member, a laterally extending arm carried by said tongs carrying member, and a fixed cam located adjacent to said ware-receiving position and adapted to cooperate with said laterally extending arm as said tongs-carrying member approaches said ware-receiving position to turn said tongs-carrying member in one direction or the other as may be necessary in order that said tongs will arrive at the ware-receiving position in predetermined relative position with respect to each other and in vertical alignment respectively with the plurality of articles which have been positioned at predetermined points at the ware-receiving position by said spotter member, whereby said tongs will always be brought back to position to engage a plurality of articles respectively at the ware-receiving position independent of the angular relation between said fixed support and said movable support about the first-named vertical axis.

Signed at Hartford, Conn. this 17th day of July 1931.

EDWARD H. LORENZ.