April 18, 1933. T. STENHOUSE ET AL 1,903,916

LEER LOADER

Filed Dec. 28, 1928 4 Sheets-Sheet 1

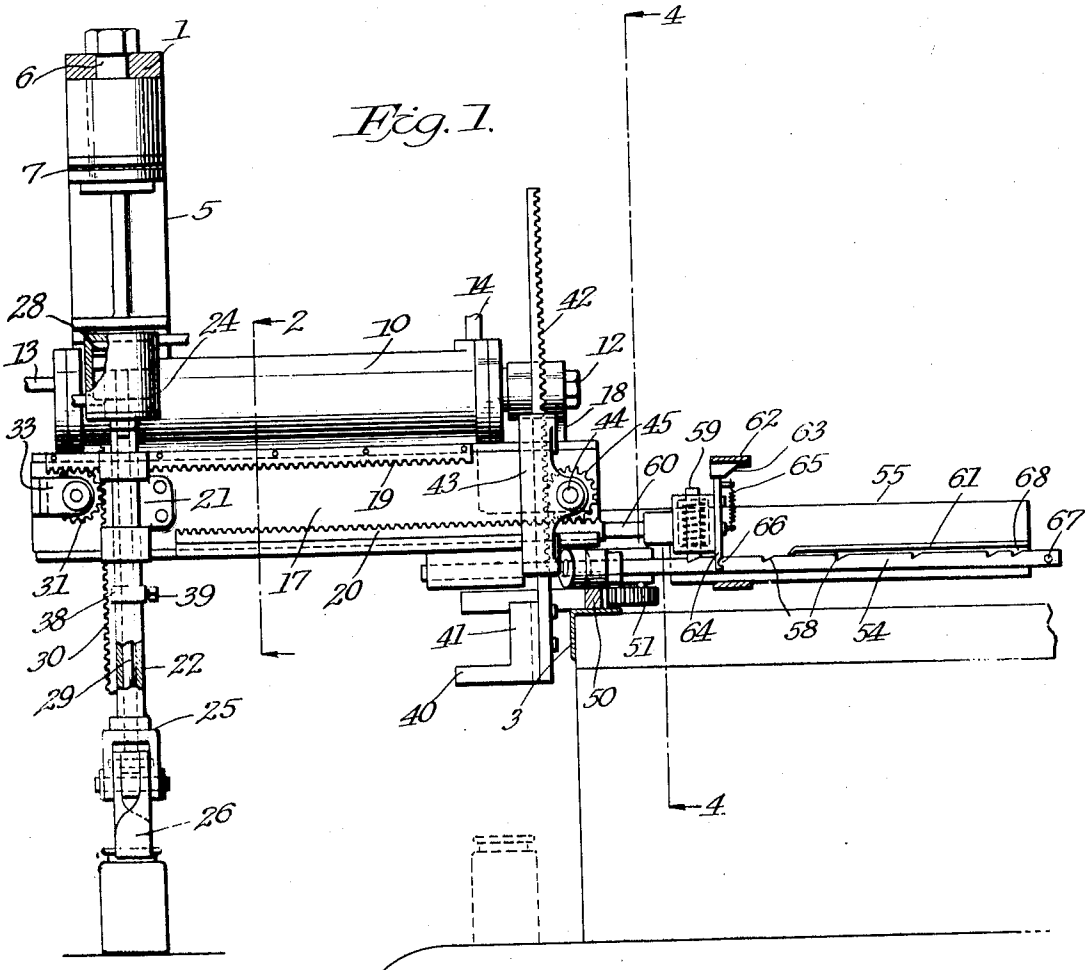


Fig. 1.

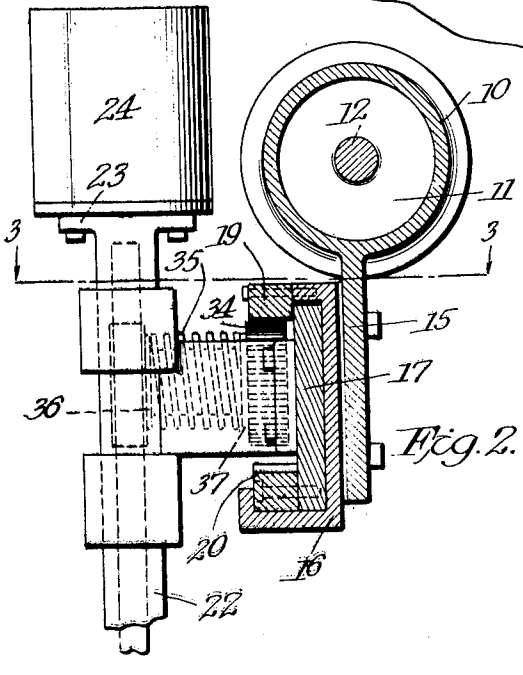


Fig. 2.

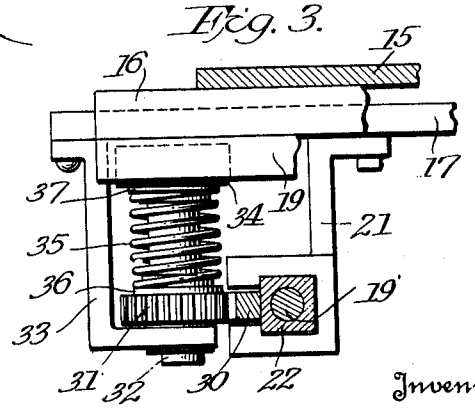


Fig. 3.

Inventors
Thomas Stenhouse.
David Stenhouse.

By Eccleston & Eccleston
Attorneys

April 18, 1933. T. STENHOUSE ET AL 1,903,916

LEER LOADER

Filed Dec. 28, 1928 4 Sheets-Sheet 2

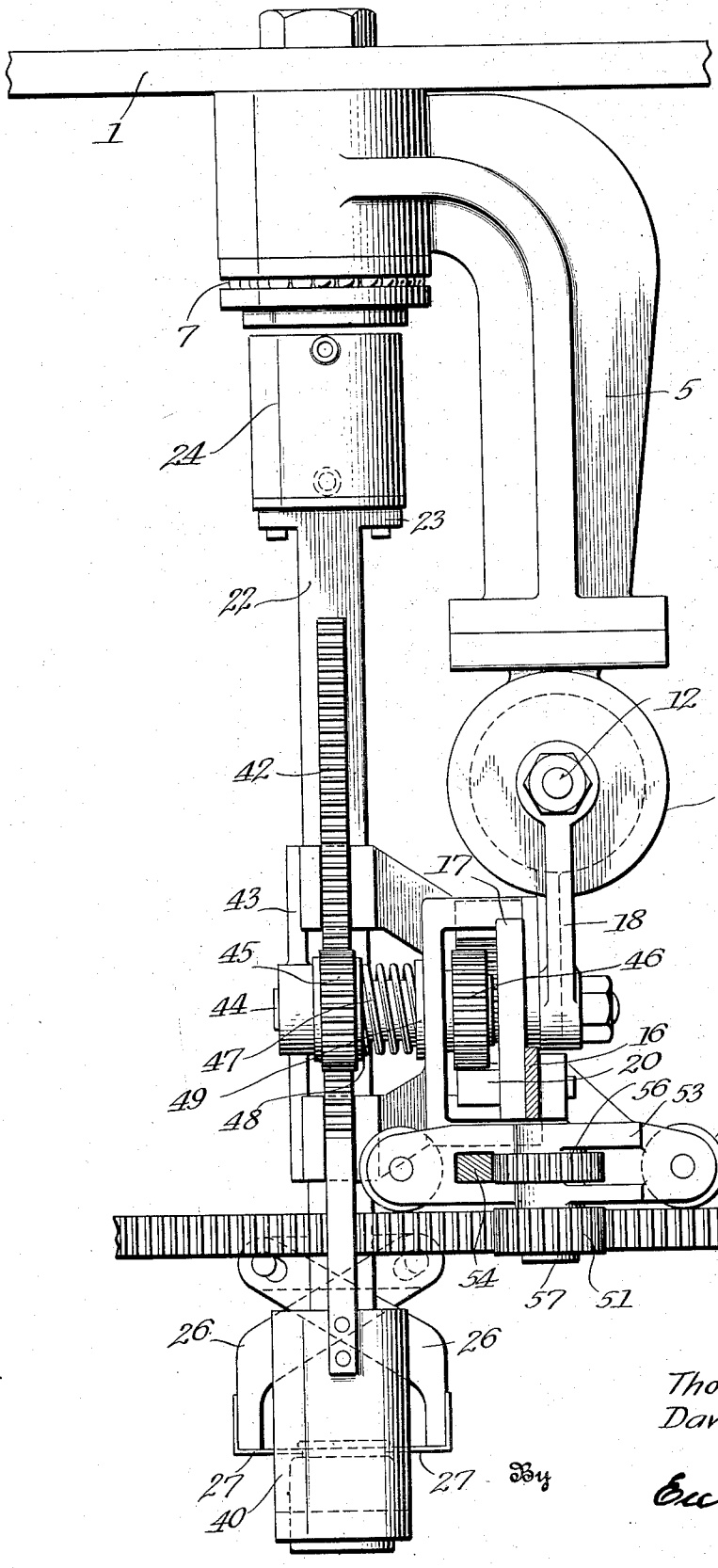


Fig. 4.

Inventors
Thomas Stenhouse.
David Stenhouse.

By Eccleston + Eccleston,
Attorneys

April 18, 1933. T. STENHOUSE ET AL 1,903,916

LEER LOADER

Filed Dec. 28, 1928 4 Sheets-Sheet 3

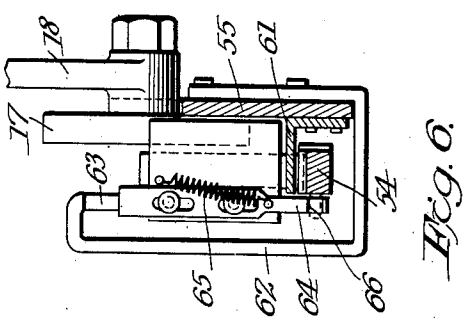


Fig. 6.

Fig. 5.

Inventors
Thomas Stenhouse.
David Stenhouse.

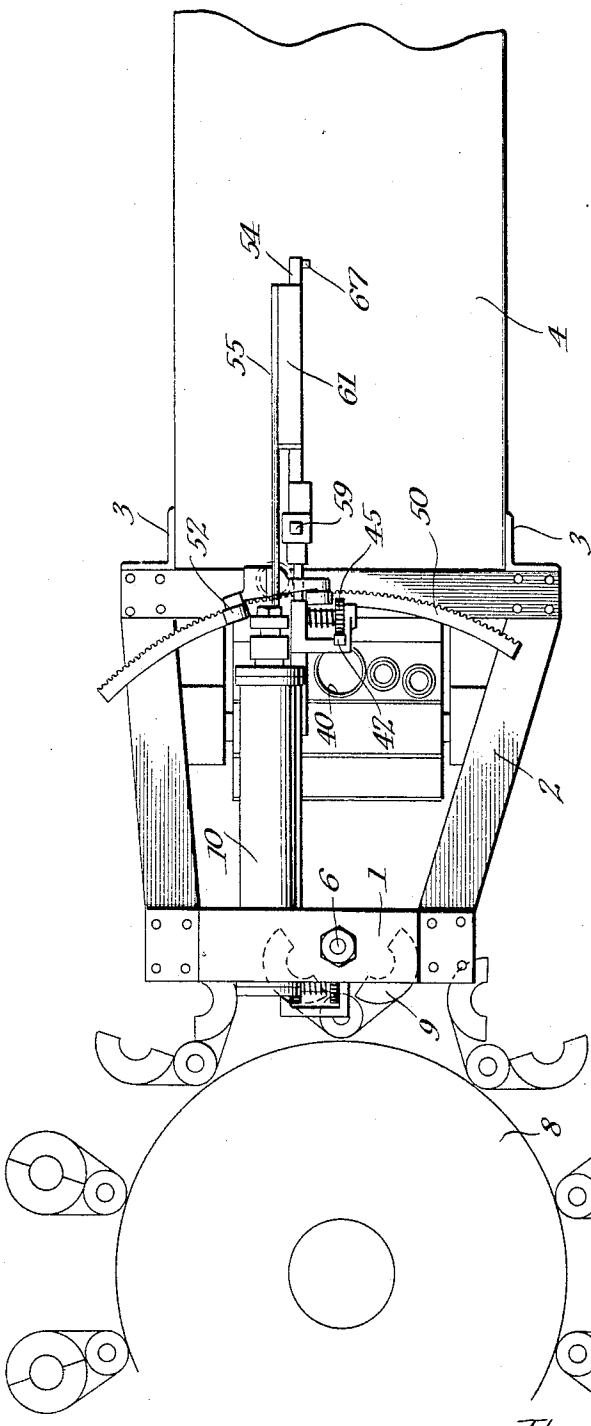
By Eccleston & Eccleston
Attorneys

April 18, 1933. T. STENHOUSE ET AL 1,903,916

LEER LOADER

Filed Dec. 28, 1928 4 Sheets-Sheet 4

Fig. 7.



Inventors
Thomas Stenhouse
David Stenhouse

By Eccleston & Eccleston
Attorneys

Patented Apr. 18, 1933 1,903,916

UNITED STATES PATENT OFFICE

THOMAS STENHOUSE AND DAVID STENHOUSE, OF WASHINGTON, PENNSYLVANIA, ASSIGNORS TO HAZEL-ATLAS GLASS CO., OF WHEELING, WEST VIRGINIA, A CORPORATION OF WEST VIRGINIA

LEER LOADER

Application filed December 28, 1928. Serial No. 328,981.

This invention relates to the handling of glassware from the forming machine to the leer, and while in some respects it is an improvement on the leer loader disclosed in the application of Coy Hardman, Serial No. 336,264, filed January 30, 1929, yet it also includes several features which are broadly new.

The primary object of the present invention is to provide a mechanism which is simple in construction and operation, and which will function to take articles of different sizes, both as to height and breadth, from the molds of the forming machine, transport them to the leer conveyer, and stack the articles thereon properly spaced and in a series of rows, and without liability of toppling them over.

Other objects and advantages of the invention will be apparent to those skilled in the art, from the following description when taken in connection with the accompanying drawings, in which

Figure 1 is a side elevational view of the apparatus with a portion of the supporting means shown in section.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a detail horizontal sectional view taken on line 3—3 of Figure 2.

Figure 4 is a vertical sectional view taken on line 4—4 of Figure 1, looking in the direction of the arrows.

Figure 5 is a plan view of the complete device.

Figure 6 is a detail vertical sectional view taken on line 6—6 of Figure 5, looking in the direction of the arrows; and

Figure 7 is a view similar to Figure 5 on a somewhat reduced scale and showing the device in its cooperative relationship with the forming machine and the leer.

Referring to the drawings in detail, numeral 1 indicates an inverted U-shaped bracket which is supported on a frame construction 2 fixedly secured to the framework 3 of a leer 4. The leer loading mechanism as a whole is supported by an L-shaped bracket 5 which is mounted for pivotal movement on a pin 6 secured in the top of the inverted U-shaped bracket 1. The pin 6 is centered directly over a mold at "take-out" position on the forming machine and is provided with a roller bearing 7 to relieve friction and facilitate the oscillatory movements of the mechanism as referred to hereinafter. The forming machine is indicated generally by the numeral 8 and the mold at "take-out" position by the numeral 9.

Fixedly secured to the lower end of the bracket 5 is a horizontally disposed cylinder 10 provided with the usual piston 11, piston rod 12, and ports 13 and 14 for the admission and exhaust of fluid pressure. Depending from the cylinder 10 is a base-plate 15 which forms a support for a guide member 16. This member 16 serves as a guide for a reciprocating plate 17; the latter being connected with the forward end of piston rod 12 by means of arm 18 which has its respective ends bolted to the rod and plate. To the upper edge of the guide member 16 is bolted a rack 19 having its teeth directed downwardly, while an oppositely disposed rack 20 is bolted to the slidably mounted plate 17.

The plate 17 also carries a bracket 21 in which is slidably mounted a sleeve 22 of substantially square cross section. Formed on the upper end of sleeve 22 is a head 23 to which a cylinder 24 is bolted, while the lower end of sleeve 22 carries a clevis 25 in which are pivoted conventional grippers 26 provided with the usual fingers 27 for engaging the neck of a bottle or the like. A piston 28 in the cylinder 24 has its rod 29 extended downwardly through the sleeve 22 and is operatively connected at its lower end to the grippers 26 so as to open and close the same in the usual manner when air is admitted to the opposite ends of the cylinder.

In certain types of forming machines, the tops of the molds are at an invariable level; and consequently in the manufacture of bottles or other articles of different lengths, the bottoms of the articles will be at different levels. The plane of the leer conveyer is fixed, and therefore it is most desirable to provide means whereby ware of different heights may be lifted a variable distance, in order that the bottoms thereof may be

brought above the plane of the leer conveyer. For accomplishing this very desirable function the sleeve 22 is provided with a rack 30 fixed to one edge thereof. This rack meshes with a gear 31 on shaft 32 which has its opposite ends supported in the plate 17 and a bracket 33 also secured to the plate. Also mounted on shaft 32 is a gear wheel 34 (see Figure 3) meshing with rack 19. These gear wheels 31 and 34 are frictionally connected by means of a coil spring 35 surrounding shaft 32 and having its ends in engagement with discs 36 and 37 which in turn frictionally engage the sides of the gear wheels. It will thus be seen that as the plate 17 is moved to the right (Figure 1) by the admission of fluid pressure to the left end of cylinder 10, the gear 31 will be caused to rotate by reason of the frictional connection between it and the gear 34. This rotation of gear 31 will cause an upward sliding movement of the sleeve 22 through the medium of rack 30, with a consequent raising of the grippers 26 and the bottle engaged thereby. It will be apparent, therefore, that a compound movement is imparted to the bottle, i. e., as it is moved toward the leer it is also raised above the plane of the mold. The extent of vertical movement imparted to sleeve 22 and its related parts is regulated by an abutment 38 which is adjustably mounted on the rod by a set screw 39. This abutment is adapted to limit upward movement of the rod by engagement with the lower edge of bracket 21; damage to the parts being avoided by reason of the frictional connection between the gears 31 and 34. Therefore, to take care of bottles or other articles of different height, it is only necessary to adjust the abutment 38 to the desired position.

The mechanism by means of which the bottles are engaged, raised to the desired height and transported to the leer, having been described, we shall now describe the mechanism which is intermittently operated to prevent teetering of the bottles as they are deposited on the leer conveyor and released.

The immediate means for preventing the toppling over of the bottles as they are released by the grippers 26 consists of a steadying ring 40 with which is associated a guiding plate 41. This device is detachably connected to the lower end of a rack 42 slidably mounted in a bracket 43. Bracket 43 forms a bearing for shaft 44 which carries the gear wheels 45 and 46. These gears are normally caused to rotate together by reason of a coil spring 47 which forces discs 48 and 49 into frictional engagement with the sides of these gears. Gear 46 meshes with the rack 20 secured to the lower edge of the slidably mounted plate 17, and rotary movement imparted to this gear is transmitted to the gear 45 which meshes with the rack 42 carrying the steadying ring 40. Therefore, as the plate 17 is moved forward by piston 12 in transporting a bottle over to the leer, the steadying ring 40 is lowered to a point adjacent the surface of the leer conveyer. And, of course, this downward movement of the steadying ring, is in advance of the arrival of the bottle. It will be obvious that as the plate 17 is withdrawn for the purpose of enabling the grippers 26 to secure another piece of ware, the ring 40 will be raised by reason of the reverse movement of the gears 45 and 46. The friction slip-clutch described above in connection with gears 45 and 46, functions as a safety device to prevent breakage of parts.

After each cycle of operations in transferring a piece of ware from the forming machine to the leer conveyer, the entire mechanism is swung about its pivot 6 a distance equal to the desired distance between the centers of adjacent pieces of ware as stacked on the leer conveyer. Thus a step-by-step movement of the device across the leer is necessary until a row of ware is placed entirely across the leer, at which time the device must be swung back across the conveyer in the opposite direction so as to begin the placing of another row of ware thereon. The mechanism for accomplishing this bodily movement of the transfer device consists of an arcuate rack 50 mounted on the leer and a gear wheel 51 carried by the transfer mechanism and in mesh with the rack. The upper plain surface of the rack bar 50 also forms a track for a pair of rollers 52 mounted in a bracket 53 bolted to the forward end of the plate or guide member 16, thus forming a support for the forward end of the mechanism in its travels back and forth across the leer. Intermittent rotary movement is imparted to the gear 51 by means of a rack 54 slidably mounted in bracket 53 and the extension 55 of plate 16. Rack 54 meshes with a gear wheel 56 fixed to a shaft 57 having its bearing in the bracket 53. This shaft 57 also carries the gear wheel 51 referred to above, and thus the movement of the rack 54 is transmitted through this shaft and the arcuate rack 50 to the transfer mechanism.

A step-by-step movement is given to the rack 54 by means of a pawl and ratchet mechanism comprising the spaced notches 58 formed in the upper face of rack bar 54 and a spring-pressed pawl or detent 59 carried by an extension 60 on rack bar 20. As this pawl moves forward in the operation of the mechanism it rides out of its particular notch 58 and onto a cover plate 61 secured to plate 55 and extending over the front portion of the bar 54. On its return movement the pawl on riding off of the cover plate 61 will engage a preceding one of the notches 58 in bar 54 and thus move the bar rearwardly a distance equivalent to the space between two notches.

This movement of the bar is translated into a transverse movement of the ware carrying mechanism as heretofore described. It will be understood, of course, that the length of each step of this step-by-step movement will be regulated in accordance with the width of the particular ware being stacked. This adjustment is accomplished by merely substituting another member 54 with differently spaced notches; or, of course, any desired means may be employed for variably spacing notches on the member 54.

For the purpose of returning the mechanism to its initial position after a complete row of ware has been placed across the leer conveyer, the following mechanism is provided:

Mounted on the extension plate 55 is a bracket 62 carrying a depending cam 63 at its upper end. This cam cooperates with a trigger 64 slidably mounted on the casing for pawl 59 and normally biased upwardly by a tension spring 65. Trigger 64 is provided with a notch 66 in its lower end adapted to engage, under certain circumstances, with a pin 67 carried by the extreme forward end of bar 54. In addition to the regularly spaced notches 58 the bar 54 is also provided with a notch 68 for a purpose which will be made clear in the description of the operation to follow.

In the normal movement of the pawl 59 forward along the bar 54 the trigger 64 rides off of the cam 63 and the spring 65 raises it upwardly above the plane of the pin 67. When the mechanism is set for delivering the last bottle of a row, however, the notch 68 is just beyond the inner end of the cover plate 61. Consequently, when the pawl 59 makes its return movement it engages notch 68 and thus brings pin 67 to a point adjacent the notch 66 of trigger 64. Upon the next forward movement of the pawl the notch 66 will engage about pin 67 before the cam 63 will allow the trigger to rise, hence the trigger will carry the bar 54 forwardly to its original position. In this movement of the bar 54 the gear wheels 56 and 51 will be rotated in a direction opposite to the intermittent rotation previously imparted to them and will thus, through the medium of rack 50, swing the entire mechanism about its pivot point 6 back to its original position where the bottle previously taken from the forming machine will be deposited upon the leer conveyer as the first of a succeeding row of ware.

The operation of the several parts of the mechanism having been fully described in connection with the description of its construction, further description thereof is believed to be unnecessary.

While the invention is described generally as an improvement on the leer loader disclosed in the application of Coy Hardman, Serial No. 336,264, filed January 30, 1929, yet it is to be understood that the present invention contains several highly desirable features which are believed to be broadly new. Such features, as well as the improved construction generally, are subject to wide change and modifications; and all such changes and modifications we aim to include in the scope of the appended claims.

What we claim is:

1. A leer loader including means for gripping ware, an adjustable stop associated with said means, a rack associated with said means and arranged vertically with respect thereto, a gear meshing with the rack, and a friction clutch associated with the gear, whereby the gear is rendered inoperative when the stop becomes effective.

2. A leer loader including means for gripping glassware, a movable member carrying said gripping means for transporting the ware to the leer, movable steadying means cooperating directly with the glassware to prevent teetering of the ware when it is deposited in the leer, and a rack and gear connection between said member and said steadying means, whereby movement of one effects movement of the other.

3. A leer loader including a member movable horizontally to transport glassware to a leer, movable steadying means cooperating directly with the glassware to prevent teetering of the ware when it is deposited in the leer, and a rack and gear connection between the said member and the said means, whereby the horizontal movement of the member causes the desired movement of the steadying means.

4. A leer loader including grippers for gripping ware, means movable horizontally to transport and deposit ware in a leer, vertically movable steadying means operated as each article is transferred, and a mechanical connection between the two means, whereby any horizontal rectilinear movement of the first-mentioned means effects vertical movement of the steadying means.

5. A leer loader including means for gripping ware, said means carried by a horizontally movable member, means for lifting the ware, means for varying the extent of lift of the ware, a rack carried by the horizontally movable member, a vertically movable steadying member, a rack for raising and lowering the steadying member, and a driving connection between the two racks.

6. A leer loader including means for gripping ware, said means carried by a horizontally movable member, means for lifting the ware a variable distance, a rack carried by the horizontally movable member, a vertically movable steadying member, a rack connected therewith by which the steadying member is raised and lowered, a driving connection between the two racks, and a friction-clutch associated with the driving connection.

7. A leer loader including a horizontally movable member, a vertical sleeve slidably mounted on said member, a cylinder carried by the sleeve, a pair of grippers, an operative connection between the grippers and cylinder, an adjustable stop carried by the sleeve, a rack carried by the sleeve, a fixed rack in cooperative relation with the horizontally movable member, and gears carried by said member and constituting a driving connection between the two racks.

8. A leer loader including means for gripping ware, a horizontally movable member carrying the grippers and transporting the grippers and ware to a leer, means for lifting the ware, means for varying the extent of lift of the ware, and a driving connection between the horizontally movable member and the ware lifting means.

9. A leer loader including means for gripping ware, a horizontally movable member carrying the grippers and transporting the grippers and ware to a leer, means operated by the horizontally movable member for lifting the ware, and means for varying the extent of lift without varying the extent of horizontal movement.

10. A leer loader including means for gripping ware, a horizontally movable member for transporting the ware to a leer, a vertically movable rack for lifting the ware, a fixed rack in cooperative relation with the horizontally movable member, a driving connection between the two racks, a horizontal rack carried by the horizontally movable member, a vertically movable steadying member, a rack carrying the steadying member, and a driving connection between the two racks last mentioned.

11. A leer loader including a pivotally mounted transfer unit, and means for moving said unit step-by-step to arrange the ware in rows, said means including an arcuate fixed rack, a gear carried by the unit and meshing with the fixed rack, and a rack movable one step at each cycle of operation of the transfer unit, said movable rack being operatively connected with said gear.

12. A leer loader including a pivotally mounted transfer unit, and means for swinging said unit step-by-step about its pivot to arrange the ware in rows, said means including a movable rack, means for moving the rack step-by-step, and a driving connection between the rack and the pivotally mounted transfer unit.

13. A leer loader including a pivotally mounted transfer unit, means for swinging the unit step-by-step across the leer, and means for returning the unit by a single continuous movement, said last mentioned means including a fixed arcuate rack, a gear carried by the unit and meshing with the fixed rack, a movable rack, an operative connection between the movable rack and the gear, said movable rack provided with a pin, a trigger adapted to engage the pin after the step-by-step movement has been completed, and means for causing the trigger to carry the rack back to the full extent of its movement.

14. A leer loader including a pivotally mounted transfer unit, means for swinging the unit step-by-step across the leer and returning the unit by a single movement, said means including a fixed arcuate rack, a gear carried by the unit and meshing with the fixed rack, a movable rack, a driving connection between the movable rack and the gear, an operating mechanism associated with the movable rack, said operating mechanism adapted to move the rack step-by-step in one direction and to give a continuous movement to the rack in the opposite direction.

15. A leer loader including a pivotally mounted transfer unit, means for swinging the unit step-by-step across the leer and returning the unit by a single movement, said means including a reciprocable member having a rack on one side, said member also provided with notches, a pin carried by the member, a pawl adapted to engage the notches to move the rack step-by-step in one direction, and a trigger adapted to engage the pin to move the rack in a single movement in the opposite direction to initial position.

16. A leer loader including a pivotally mounted transfer unit, means for swinging the unit step-by-step across the leer and returning the unit by a single movement, said means including a reciprocable member carrying a rack, said member provided with notches, a pin carried by the member, a reciprocable operating device associated with the member, a pawl carried by said device and adapted to engage the notches to move the member step-by-step in one direction, a trigger carried by the device, and means for moving the trigger to position to engage the pin when the member has reached the end of its step-by-step movement.

17. A leer loader including means for gripping articles, a horizontally reciprocable member for transporting the grippers and the articles to a leer, vertically reciprocable means for preventing teetering of the articles, and means for spacing the articles in rows, and mechanical connections for operating said two means last-mentioned by the horizontally reciprocable member.

18. A leer loader including a horizontally reciprocable member, and means actuated by said member for lifting the ware a variable height, a ware steadying device means actuated by said member, for operating the steadying device, means actuated by said member for swinging said member step-by-step in one direction, and means actuated by said member for swinging said member in a

continuous movement in the opposite direction.

19. A leer loader including a member adapted to reciprocate and oscillate in a horizontal plane, ware gripping means carried by said member, means operated by the reciprocable movement for lifting the grippers to a variable position and for lowering the grippers to a fixed position, a ware steadying device, means operated by the reciprocable movement for raising and lowering the steadying device, and means operated by the reciprocable movement for effecting the oscillating movement.

20. A leer loader including a pivotally mounted frame, a horizontally reciprocable member carried by said frame, ware gripping means carried by the reciprocable member, means actuated by the reciprocable member for lifting the ware a variable distance, and means actuated by the reciprocable member for imparting a step-by-step swinging movement to the frame.

21. A leer loader including a pivotally mounted frame, a horizontally reciprocable member carried by the frame, means for gripping the ware, a vertical rack slidably mounted on said reciprocable member and carrying the gripping means, an adjustable stop carried by the rack, a fixed rack in cooperative relation with the reciprocable member, a driving connection between the two racks, a horizontal rack carried by the reciprocable member, a steadying device, a rack carrying the steadying device, a driving connection between the two racks last mentioned, and means carried by the reciprocable member for imparting to said frame a step-by-step swinging movement in one direction and a continuous swinging movement in the opposite direction.

THOMAS STENHOUSE.
DAVID STENHOUSE.