To all whom it may concern:

Be it known that I, Joseph A. Fuchs, a citizen of the United States, residing in the city of Richmond, in the county of Wayne, State of Indiana, have invented a new and useful Pick-Up and Transfer Mechanism for Bottle-Making Machines, of which the following is a full, clear, and comprehensive specification and description of the same.

The object of my present invention, broadly speaking, is to provide a pick up and transfer mechanism for bottle making machines, the same being comparatively simple in its operation, strong and durable in construction, positive in its actions, automatic in its operation, in which the cost of operation will be practically nil, and which can be manufactured and sold at a comparatively low price.

More specifically stated, my object is to provide a pick up and transfer mechanism adapted to automatically grasp and lift bottles from the mold in which they are formed and transfer them to a conveyor by which they will be carried to an annealing furnace.

In order to accomplish the results expeditiously and without danger of breakage the following movements are required:

1. Grasping the neck of the bottle, lifting the bottle directly upward out of the mold, giving it a horizontal turn in order that the jaws or fingers will open at right-angles to the travel of the conveyor, carrying the bottle horizontally, then lowering it vertically, and finally depositing it upon the moving conveyor to be carried thereby, and finally returning the mechanism to repeat said operations.

Other objects and particular advantages of the invention will suggest themselves to the expert in this line, in the course of the following description.

The preferred means for carrying out the principles of my invention in a practical manner is shown in the accompanying two sheets of drawings, in which—Figure 1 is a vertical central section of the device, as taken on the line 1—1 of Fig. 2. Figure 2 is an outside elevation, taken at right-angles to Fig. 1, and as looking to the left on Fig. 1. Figure 3 is a horizontal plan, partly in section as taken on the line 3—3 of Fig. 1. Figure 4 is a horizontal plan, partly in section taken on line 4—4 of Fig. 2. Figure 5 is a top plan of the bell-crank, and Figure 6 is a detail view showing the shifting plate. Similar indices denote like parts throughout the several views.

In order that the construction, the operation, and several advantages of the invention may be more fully understood and appreciated I will now take up a detailed description thereof in which I will set forth the same as comprehensively as I may.

Referring now to the drawings in detail:

Numeral 1 denotes the supporting bar or track, the end portion thereof, not shown, being rigidly secured to and extending horizontally from a cylinder, or other device (not shown), which forms no part of this invention, and from said cylinder extends the rod 2, which is adapted to reciprocate by power in the usual manner.

Numerals 3 and 4 denote collars which are secured around the rod 2 by means of the respective pins 5 and 6, or otherwise.

Formed in the rod 2 and opening laterally are the bell-crank notches 7, hereinafter referred to. Also formed in the rod 2, and opening downward is the notch 8, hereinafter referred to.

The body of the device is denoted by the numeral 9, the back of which is provided with a horizontal channel to admit the bar 1, as in Fig. 1, where it is retained in sliding connection therewith by the plates 10 and 11 which are secured to the rear face of the body 9 by means of the respective pairs of screws 33 and 34. By the above it is seen that the body 9 is adapted to slide on the bar 1, moving laterally therealong.

As shown in Fig. 1, the rod 2 extends through the body 9, being slideable therein, but by reason of the collars 3 and 4, which are adapted to impinge the respective sides of the body 9, it is evident that as the rod 2 reciprocates it will, during a part of each stroke, carry with it the body 9, while during another portion of each stroke the body 9 will be stationary.

Numeral 18 denotes a vertical shaft, extending through the body 9, and carried therewith. Numeral 19 denotes a bushing which is secured to the body 9 by the taper pin 20, and the shaft 18 is adapted to slide in said bushing. A flange 19 extends out from around the lower end of said bushing as shown.
Located in the body 9, and surrounding the shaft 18, moveable on said shaft, is the double ended pawl 12, having the lugs 12a and 12b formed integral therewith, and having the stem 12c also integral therewith, which stem projects horizontally and opposite to said lugs. A hollow projection 9b extends out from the body 9, in alinement with the stem 12c. A plunger 13 is slidably mounted in the projection 9b, and its inner end is beveled to slide on the bevels of the end of the stem 12c. A helical spring 14 is adapted to resiliently force the plunger 13 inward, whereby the pawl 12 can not remain in neutral position, that is—one of the lugs 12a or 12b must always be in resilient contact with the bar 1 and adapted to enter one of the two notches 35 formed in the bar 1. Extending upward from the body 9 is the arm 17 which carries the axle 16, on which axle a bell-crank, comprising the arms 15 and 15a, is rotatably mounted. The forked end of the arm 15 strikes the rod 2 and fits in the notches 7, forming a loose joint. And the end of the arm 15a strikes the shaft 18 and fits in the notches 7a thereof, thereby forming a loose joint connection with the shaft 18.

Surrounding the lower portion of the bushing 19, extending therebelow, and resting on the flange 19a, is the cross-head 22, which is adapted to slide upward against the resiliency of the spring 21.

The upper portion of the cross-head 22 has two angularly disposed arms, A and B, extending out therefrom and adapted to be engaged by the lower end of the bolt 29.

The lower end of said spring 21 is secured in the cross-head 22, and its upper end is secured in the body 9, and the tension of said spring is such as to normally keep the cross-head turned whereby the arm B is in contact with the plate 32, as shown in dotted lines in Fig. 3. The plate 32 being secured by the screws 33, and therefore carried with the body 9.

Numeral 23 denotes a spool-shaped member, which is secured to the reduced lower end portion of the shaft 16 by means of the pin 28, the purpose of said spool-member being hereinafter explained.

Two oppositely extending pairs of ears form parts of the cross-head 22, in which ears are mounted the respective arms 25, the same being rotatably mounted on the respective axles 24 which extend through the respective pairs of ears, as shown.

Numeral 26 denotes the two right-angular pick-up fingers, forming jaws, which are secured to the respective arms 25 by the screws 27. The inner edges, y and z, of the fingers 26 are formed concave, in order that when they come near together they may engage around and grasp the neck of a bottle when they are moved toward each other.

Numeral 29 denotes a stop or shifting bolt, one end of which is secured by means of the nut 36 to the plate 30. Said plate 30 is fastened by means of the screw 31 to the face of the bar 1.

Said shifting-bolt extends across in front of the body 9 and its free end portion is bent downward at right-angles to be engaged by the fingers A and B of the cross-head. The plate 32, Fig. 6, extends down to where it may be engaged by the arm B, as shown by its position in dotted lines in Fig. 3, to form a stop to prevent the cross-head 22 from being turned beyond a certain point.

Modus operandi.—The positions of the various parts, as shown in the drawings, indicate that the rod 2 is in the moving to the right, carrying with it the body 9, and therefore carrying the entire device as a unit, for the reason that the collar 4 is in contact with the body 9 as shown.

Now at the end of this stroke, that is when the rod 2 reaches its limit to the right, the lug 12a of the pawl 12 will enter the notch 35 to prevent the unit from moving to the left for a short interval, at which time the unit will be directly over the bottle in the bottle making machine and the fingers 26 will be located around but spaced from the bottle. Now the movement of the rod 2 is reversed and starts moving to the left, but there will be an interval before the unit moves as a whole, by reason of the space between the collar 3 and the body 9. Now as the rod 2 moves to the left the bell-crank will be turned on its shaft 16 which of course will raise the shaft 18, thereby causing the spool 23, moving upward, to turn the fingers 26 thereby causing the said fingers to grasp the bottle, and immediately following which the cross-head 22 will be raised against the resiliency of the spring 21, thereby lifting the bottle and holding it in suspension. Now by this time the rod 2 has moved to position whereby the shoulder formed by the end of the notch 8, Fig. 4, will strike the stem 12c, thereby turning the pawl 12 and removing the lug 12b from out of the notch 35, immediately following which the collar 3 will engage the body 9, therefore as the rod 2 continues to move to the left the whole unit will be carried to the left therewith.

At this point it should be understood that the end of the notch 8 engaging the stem 12c will compress the spring 14 whereby the point of the stem finally passes over the point of the plunger 13, the expansion of the spring 14 against the plunger will complete the last half of the movement of the pawl 12 and thereby causing the lug 12b to snap into contact with the bar 1, and be ready to drop into the other notch 35 at the left end of the stroke.

Returning now to the movements of the device: As the unit moves to the left, and
before it reaches its limit, the turned end of the bolt 29 will be engaged by the finger A, thereby turning the cross-head against the horizontal twist of the spring 21, thereby giving the cross-head a quarter turn (more or less depending on the position to which the bolt 29 has been set) thereby turning the fingers and the bottle to position ready to be released.

When the rod 2 reaches its limit to the left the unit will stop directly over a conveyor, then as the rod 2 moves to the right, the unit of course remaining stationary until the collar engages the body 9, but during this interval the bell-crank, operated by the movement of the rod 2, will lower the shaft 18, together with the bottle carried by the fingers, following which the fingers 26 will release the bottle, resting it upon a conveyor.

then as the unit moves to the right it will carry the fingers away from the bottle, and the finger A being gradually released from pressure upon the bolt 29, the spring 21 will be permitted to return the cross-head to its former position. And as the unit reaches its right-hand limit the lug 12 will again enter the notch 35, thereby completing the cycle of operation.

It should be understood that the purpose of the horizontal turning of the fingers is that they must be in one position to grasp the bottle in the mold, while when the bottle is to be released the fingers must be turned in order that they will open at right angles to the movement of the conveyor, whereby the bottle will be carried out from between the jaws without contact therewith. However under certain conditions said turning of the fingers is not required, in which case it may be dispensed with.

I desire that it be understood that various changes may be made in the details herein set forth without departing from the spirit of my invention and without sacrificing any of the advantages thereof which are new and useful.

Having now fully shown and described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A pick-up and transfer mechanism for bottle making machines, comprising a reciprocating rod, a unitary structure, means whereby said structure is carried by the said rod through a portion of the stroke in each direction, and means for locking the structure at each end of its movements.

2. A pick-up and transfer mechanism for bottle making machines, comprising a reciprocating rod; a structure forming a unit, means whereby the unit is carried with the rod through only a portion of the movements of the rod in each direction, means for locking the unit at each end of its movement, and means for raising and lowering a portion of the unit during the period when the unit is not moving horizontally.

3. A device of the nature set forth, comprising, in combination with a stationary horizontal element and a horizontally reciprocating element, a unitary structure, means whereby the unit is carried bodily with the reciprocating element but only through a portion of each movement of the reciprocating element by which the unit remains stationary during a part of each movement of the reciprocating element, means whereby a portion of the unit is moved up by the action of the reciprocating element during one interval when the unit is stationary and while the reciprocating element is moving in one direction, and by the same means said portion of the unit is moved downward by the action of the reciprocating element during the next interval when the unit is stationary and while the reciprocating element is moving in the other direction.

4. A device of the nature set forth comprising in combination with a stationary element and a horizontally reciprocating element, a mechanism forming a unit adapted to be carried with the reciprocating element through only a portion of each movement of the reciprocating element, said unit comprising a body member, a vertical shaft extending through the body member, means whereby said shaft is raised and lowered by the action of the reciprocating element when said body member is stationary, fingers carried by the lower end of said shaft for grasping a bottle, means for opening and closing said fingers to grasp and release a bottle, and means for turning said fingers horizontally and circumferentially of said shaft.

5. A device of the nature set forth including a mechanical unit comprising a body member, a horizontal rod slidably mounted to one side of said body, means for limiting the movements of said body with relation to said rod, a vertical shaft extending through said body, a bell-crank for moving said shaft up and down by the movements of said rod, a pawl device located in the body and adapted to turn on said shaft, a cross-head mounted to the lower portion of the shaft, a spring normally retaining said cross-head in one position, a stop-bolt carried by the body for turning said cross-head in one direction against the resiliency of said spring, arms carried by the lower end of said shaft, means whereby said arms are adapted to turn laterally opposite to each other, and fingers, forming jaws, connected to said arms and adapted to grasp and release a bottle when operated laterally, all substantially as set forth.
6. An attachment for bottle making machines, a relatively stationary horizontal bar, a rod to reciprocate parallel to said bar, a mechanical unit slidably mounted on said bar and also slidable on said rod and adapted to be carried with said rod during only a portion of each movement of the rod, said unit including a pair of fingers adapted to grasp a bottle, automatic means for opening and closing said fingers, automatic means for raising and lowering said fingers, and automatic means for turning said fingers horizontally, all substantially as set forth.

7. An attachment for bottle making machines, comprising in combination with a relatively stationary member, and a reciprocating member parallel therewith; a body member slidably connected with said stationary member with the reciprocating member movable therethrough, means carried by the reciprocating member to engage each side of said body whereby the body will be carried with the reciprocating member during only a portion of each stroke of the reciprocating member, a shaft adapted to slide in said body member at right angles to said reciprocating member, means whereby the reciprocating member will move said shaft endwise in one direction while the body member is stationary at one end of its movement and will move said shaft endwise in the other direction while the body member is stationary at the other end of its movement, means for locking the body member at each end of its movements, jaws carried by said shaft, and automatic means for opening and closing said jaws while the body member is stationary.

JOSEPH A. FUCHS.