J. J. MEYER, Jr. & J. G. LEPPER.

LIFT-OUT FOR BOTTLE MAKING MACHINES.

APPLICATION FILED JULY 5, 1916.

1,211,611.

Patented Jan. 9, 1917.

3 SHEETS—SHEET 1.

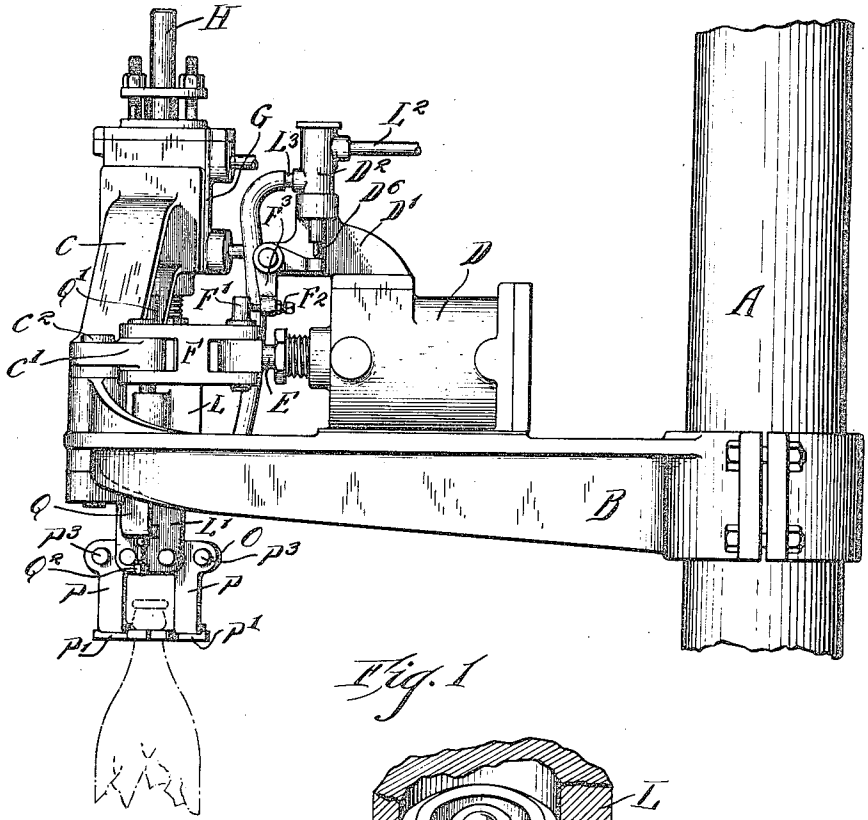


Fig. 1

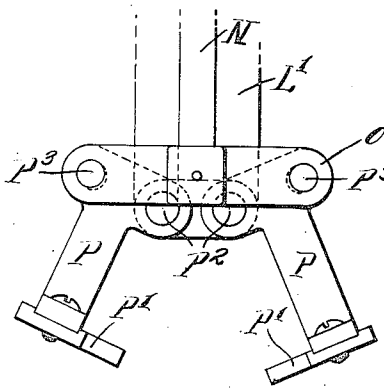


Fig. 6

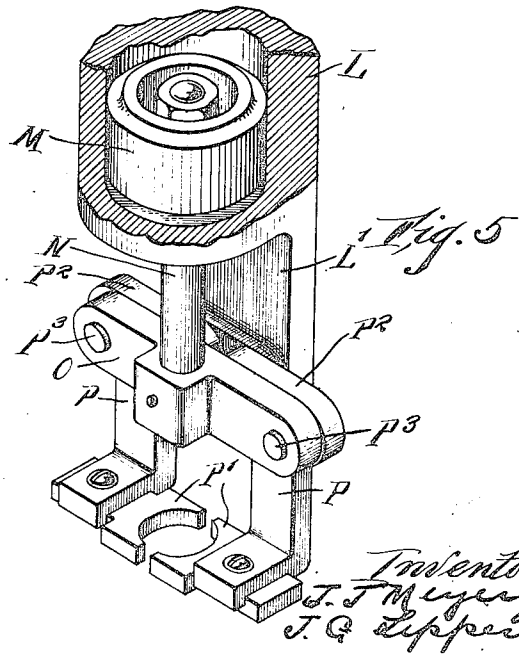


Fig. 5

Inventors,
J. J. Meyer Jr.
J. G. Lepper

By Hull Smith Brock & West
Attys.

J. J. MEYER, JR. & J. G. LEPPER.

LIFT-OUT FOR BOTTLE MAKING MACHINES.

APPLICATION FILED JULY 5, 1916.

1,211,611.

Patented Jan. 9, 1917.

3 SHEETS—SHEET 2.

Fig. 2.

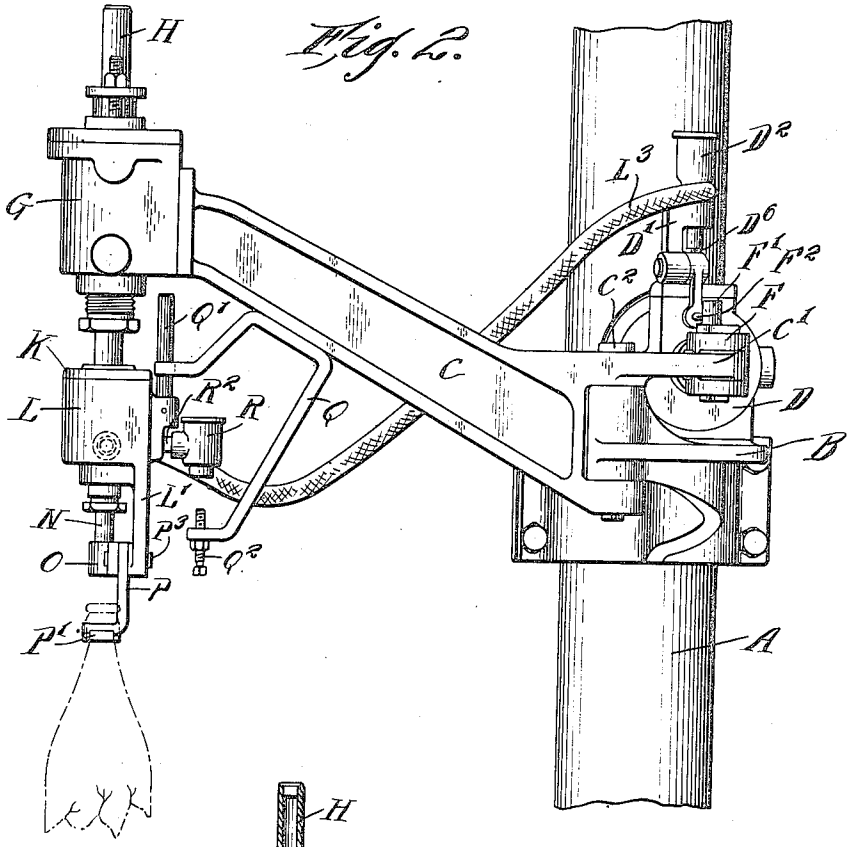
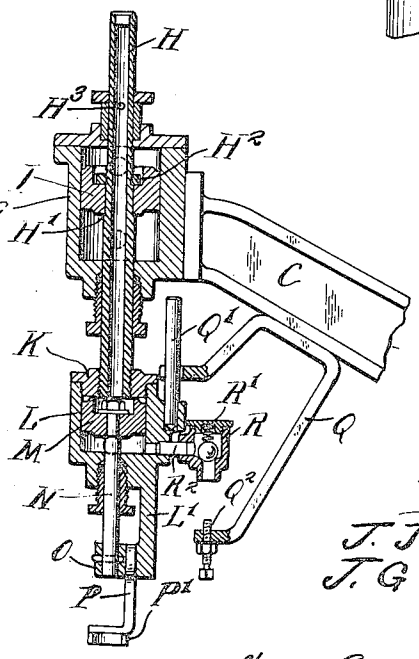


Fig. 4.



INVENTORS,
J. J. Meyer Jr
J. G. Lepper.

By Hull Smith Brock & West
Att'ys.

J. J. MEYER, Jr. & J. G. LEPPER.

LIFT-OUT FOR BOTTLE MAKING MACHINES.

APPLICATION FILED JULY 5, 1916.

1,211,611.

Patented Jan. 9, 1917.

3 SHEETS—SHEET 3.

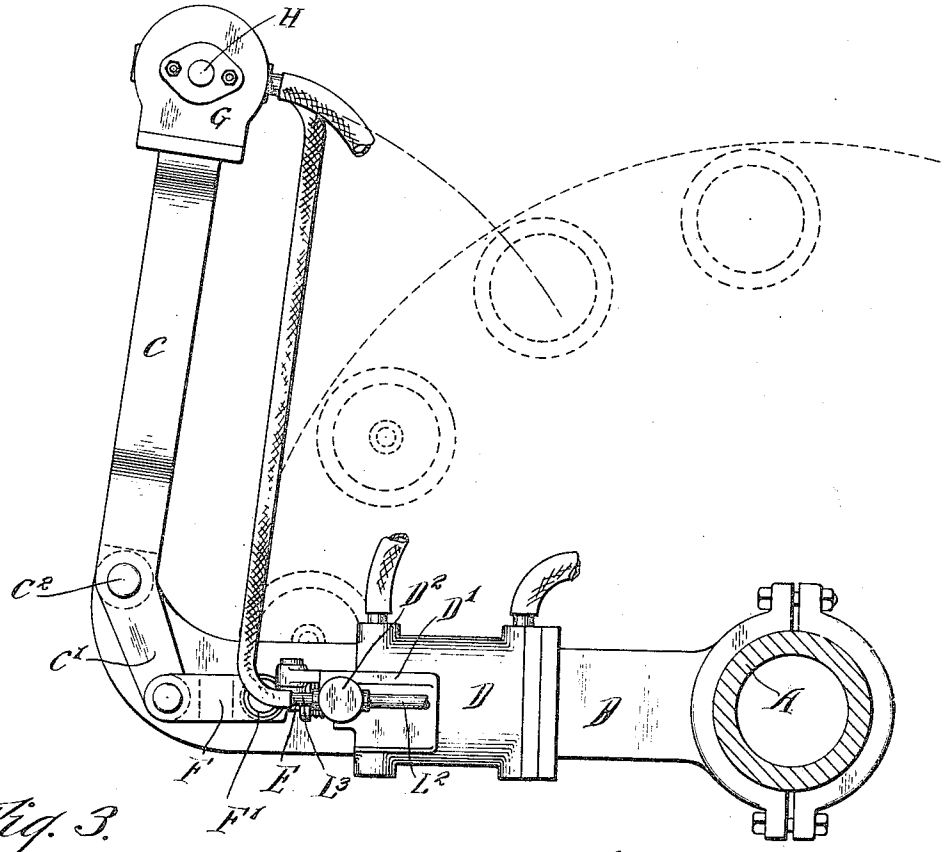


Fig. 3.

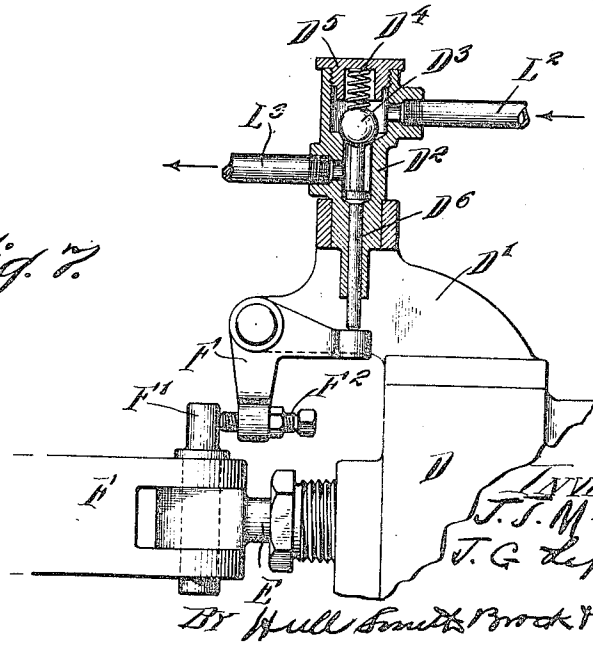


Fig. 7.

INVENTORS
J. J. Meyer Jr
J. G. Lepper
By Hull Smith & Brock & West
Atty's.

UNITED STATES PATENT OFFICE.

JOHN J. MEYER, JR., OF GLENSHAW, PENNSYLVANIA, AND JOHN G. LEPPER, OF BRIDGEPORT, CONNECTICUT, ASSIGNORS TO GLENSHAW GLASS COMPANY, OF GLENSHAW, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

LIFT-OUT FOR BOTTLE-MAKING MACHINES.

1,211,611. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed July 5, 1916. Serial No. 107,517.

To all whom it may concern:

Be it known that we, JOHN J. MEYER, Jr., residing at Glenshaw, in the county of Allegheny and State of Pennsylvania, and JOHN G. LEPPER, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in Lift-Outs for Bottle-Making Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to bottle making machinery and more particularly to a mechanism for lifting the finished bottle from the mold and transferring it to any suitable delivery or carrier device.

In most of the commercial bottle making machines the molding apparatus moves turretwise around a central column, and compressed air is utilized to blow the bottle both in its initial and final shape, and the present invention is designed to be used with machines of this type; the object being to provide a simple and efficient mechanism which can be attached to any and all of the machines now in use and which will operate by compressed air to lift each finished bottle from its mold and move the same laterally and deposit it upon a suitable and conveniently arranged carrier or delivering device, and with these objects in view the invention consists in the novel features of the construction and the manner of combining or arranging the same, all of which will be fully described hereinafter and pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is a view illustrating one form of mechanism embodying our inventive idea; Fig. 2 is a view of the device taken from a position substantially at right angles to that of Fig. 1; Fig. 3 is a top plan view; Fig. 4 is a vertical sectional view of the bottle lifting mechanism; Fig. 5 is a detail sectional perspective illustrating the bottle gripping device; Fig. 6 is a detail view illustrating the manner of releasing the bottle; and Fig. 7 is a detail view partly in section illustrating the air control for effecting the releasing of the bottle gripping device.

As previously stated bottle making machines to which our invention is applicable are provided with a central column or standard which we have herein shown at A and for the purpose of more clearly illustrating the special features of our invention we have omitted the other portions of the bottle making machine. A horizontal arm B is securely fastened upon the column A and it will be understood that this column and arm B are stationary at all times, but the principle of the invention could be applied to a machine in which the molds are stationary and the column and arm rotated.

A movable arm C is hinged in any suitable manner to the outer end of the arm B and this movable arm C has an extension C′ which extends at an obtuse angle beyond the pivotal connection as most clearly shown in Fig. 3.

An air cylinder D is securely bolted upon the arm B about midway its length and the piston rod E of the piston (not shown) working in said cylinder is connected with the extension C′ of the arm C through the medium of a link F so that as the piston is moved back and forth the arm C is swung upon its pivotal connection C^2 in the arc of a circle as indicated in dotted lines in Fig. 3, the molds being indicated also in dotted lines, and it will be understood that these molds travel around turret-wise carrying the molded bottles in their various stages of completion, and the arms B and C are of such size and shape that when the movable arm C is swung inward, its free end and the mechanism carried thereon will rest directly over the mold carrying the finished bottle. For the purpose of lifting this bottle clear of the mold and then moving the same laterally or away from the machine proper we provide a cylinder G upon the free end of the arm C, and a tubular piston rod H working through the cylinder, said rod being closed at its upper end. The upper portion of this piston rod works through a suitable stuffing box arranged in the upper end or head of the cylinder while the lower portion works through the lower end or head of the cylinder and in turn is connected, by screwing or otherwise, into the head K of a cylinder L.

A piston I is arranged upon the hollow or tubular piston rod H within the cylinder

G, said piston seating upon the shoulder H′ and held in place by means of a nut H^2. The cylinder is supplied with inlet and exhaust ports which connect with suitable air pipes (not shown) and which lead from the bottle machine proper. The tubular piston rod H has an opening H^3 in the upper portion, the purpose of which will appear hereinafter.

The cylinder L has a piston M arranged therein, said piston having a rod N projecting downwardly through the lower end or head of the cylinder, said rod being connected to a cross head O which actuates the bottle gripping members P carrying the adjustable jaws P′ which have their inner ends shaped to engage the neck of the bottle. The gripping members P are in the form of bell-crank levers and are arranged with their horizontal portions toward each other, the inner end of each horizontal portion being pivotally connected at P^2 to the lower end of a depending extension L′ of the cylinder L and the outer ends of the horizontal portions are pivotally connected at P^3 to the outer ends of the cross head O, the pivot openings being made slightly elongated to allow for the swinging movement of the members P.

As previously stated the jaws P′ are adjustable, in order to accommodate various sizes of bottle necks.

From the construction and arrangement of the parts just described it is obvious that as the piston M descends the gripping members will be brought together as illustrated in Figs. 2 and 5, and when the piston is raised the gripping members will be separated as indicated in Fig. 6.

By means of suitable air controlling devices (not shown) air will be injected into the cylinder D at the proper time to swing the arm C inwardly so that the cylinders G and L will rest directly over the mold carrying the finished bottle, and just as the movable arm completes its inward swing, air is cut into the cylinder G and the piston I and rod H move downwardly until the openings H^3 come within the cylinder G and a portion of the air then passes down through the tubular rod H into the cylinder L and forces the piston M downwardly carrying with it the rod N and bringing the gripping members P and P′ together upon the neck of the bottle as most clearly shown in Figs. 1 and 2. The air is then cut into the cylinder G upon the opposite side of the piston and the cylinder L is raised but the piston M remains in its lowered position in cylinder L thereby holding the bottle tight between the jaws P′. Air is then cut into the cylinder D to swing the arm C outwardly as shown in Fig. 3 and at the completion of the outward movement the piston rod E approaches its innermost position bringing with it the link F which is provided with an upwardly projecting lug F′ which engages an adjustable set screw F^2 carried at the lower end of a bell-crank lever F^3 pivoted to a bracket D′ bolted to the top of the cylinder D, at one side of the center, said bracket also carrying a valve casing D^2 in which is located a ball valve D^3 normally held seated by means of a coil spring D^4 located within the cap D^5 of the casing, and leading into and out of the casing are the air pipes L^2 and L^3, respectively, the pipe L^3 leading to the cylinder L for the purpose of raising the piston M in order to separate the bottle gripping members just as the arm C completes its outward movement and this is accomplished by unseating the ball valve D^3 by means of the rod D^6 which passes upwardly through the valve casing D^2 and is operated upon by the bell-crank F^3 just as the piston in the cylinder D completes its inward movement.

In order to permit the piston M to be forced to the bottom of the cylinder L we provide a relief valve R at one side of the cylinder, this valve being in the form of a ball held upon its seat by the spring R′, and the casing containing this valve communicates with the cylinder by means of a branch pipe R^2. A bracket Q is attached to the arm C near its outer end and the upper member thereof is bifurcated and works upon a guide rod Q′ projecting upwardly from the cylinder L, and at its lower end the bracket carries an adjustable screw or pin Q^2 which is adapted to enter an opening or passageway in the bottom of the casing of the relief valve for the purpose of unseating the same and permitting the escape of air from the cylinder L, it being obvious that as the cylinder is forced down, carrying with it the relief valve within its chamber, said valve will engage the pin Q^2 and be unseated. The moment the cylinder L is raised the valve automatically seats itself and cuts off all further escape of air.

When the piston rod H is moved up for the purpose of raising the cylinder L and carrying with it the bottle, the air within the tubular rod exhausts through the openings H^3, which have previously served as inlets for the introduction of air into the cylinder L for forcing down the piston M.

By means of the mechanism herein shown and described it will be readily understood that by means of compressed air the arm C is swung inwardly so as to bring the outer end thereof in direct vertical alinement with the mold carrying the finished bottle, and then by the force of air the bottle gripping members in their separated positions are lowered about the neck of the bottle, then closed in upon said neck, raised so as to lift the bottle from the mold and then swung outwardly in order to move the bottle entirely

clear of the machine, and finally separated or opened in order to drop the bottle upon the delivery or carrier device.

Having thus described our invention, what we claim is:

1. In a machine of the kind described, the combination with a movable arm, of pneumatically operated means for moving said arm, a bottle gripping device carried at the free end of said arm, and pneumatically operated means for raising and lowering, open- and closing said gripping device.

2. In a device of the kind described, the combination with a movable arm and means for moving the same, of an air cylinder arranged at the end of said arm, a second cylinder operatively connected with said first mentioned cylinder, a bottle gripping device, and operative connections between said gripping device and said second cylinder.

3. In a device of the kind described, the combination with a movable arm and means for moving the same, of an air cylinder arranged at the end of said arm, a rod working through said cylinder, a second cylinder upon the end of said rod, a bottle gripping device carried by and operated from said cylinder together with pneumatically operative means for raising and lowering said second cylinder.

4. In a device of the kind described, the combination with a movable arm and means for moving the same, of an air cylinder arranged at the end of said arm, a second cylinder arranged below the first named cylinder and movable with reference thereto, a bottle gripping device carried by and operated from said second cylinder together with automatic means for opening the bottle gripping device simultaneously with the completion of the outward movement of the arm.

5. In a machine of the kind described, the combination with a movable arm and means for moving the same, of an air cylinder arranged at the free end of said arm, a piston movable therein the rod of said piston passing through said cylinder, a second cylinder carried at the lower end of said rod, a piston in said second cylinder operative from the first cylinder, a bottle gripping device connected with said piston of the second cylinder, and means operative from the arm moving means to release said bottle gripping device.

6. In a machine of the kind described, a movable arm and means for moving the same, an air cylinder arranged at the free end of said arm, a piston within said cylinder, the rod of said piston passing through said cylinder, a second cylinder at the lower end of said rod, a piston in said second cylinder, a bottle gripping device connected with said second piston, pneumatically operated means for raising and lowering the second cylinder together with pneumatically operated means for raising and lowering the second piston.

In testimony whereof, we hereunto affix our signatures in the presence of two witnesses.

JOHN J. MEYER, Jr.
JOHN G. LEPPER.

Witnesses:
HARRY W. SHROPSHIRE,
EVELYN THORNTON.