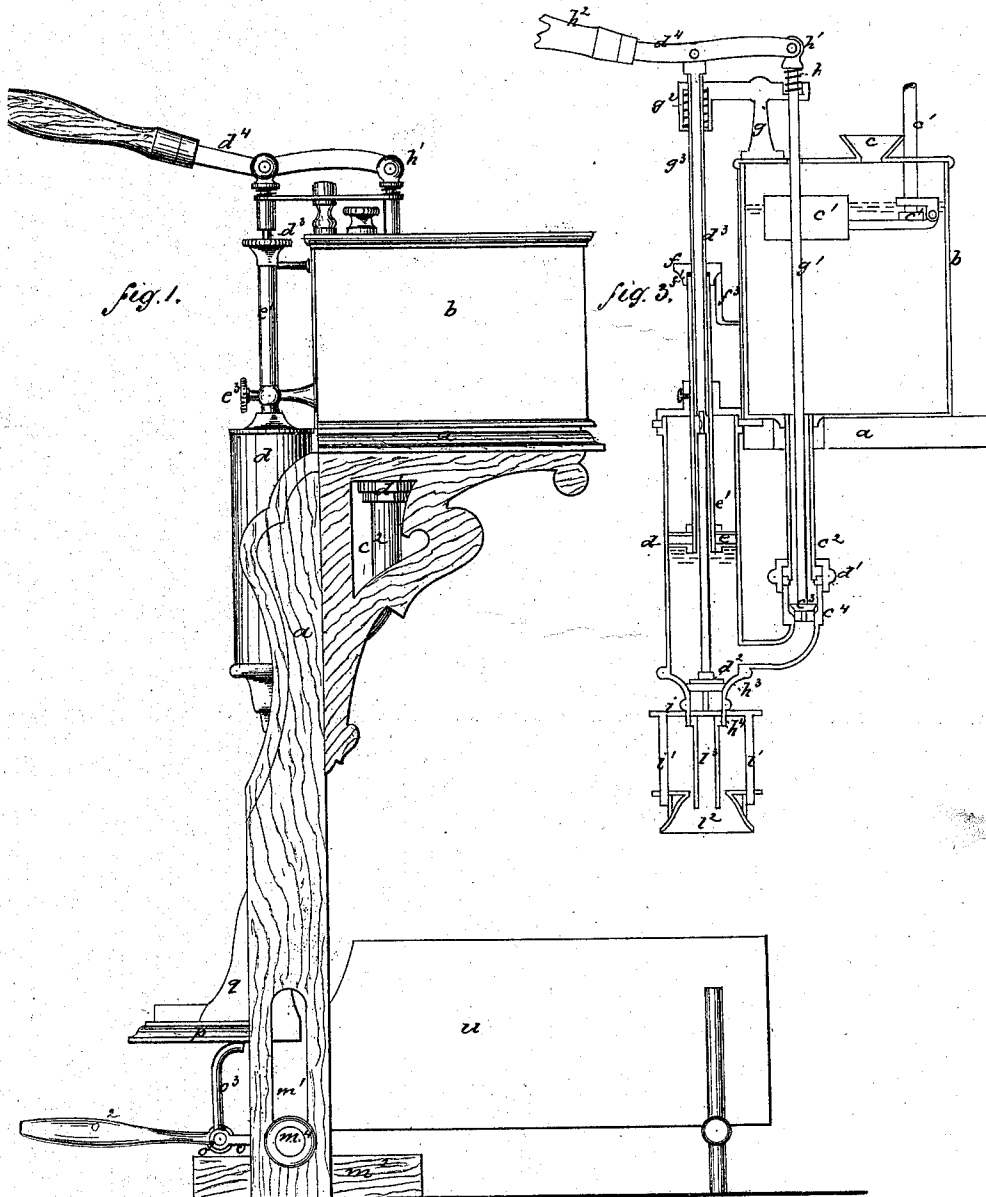


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BOTTLE FILLING APPARATUS.

No. 105,328.

Patented July 12, 1870.



Witnesses:

Victor Hagmann
C. A. Gregory

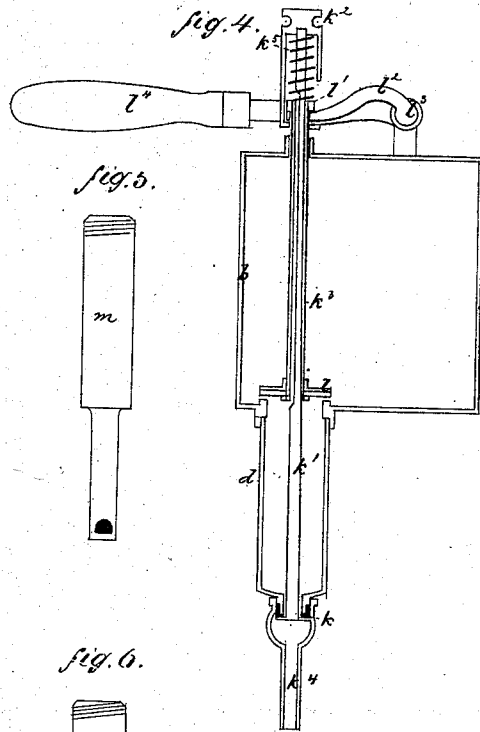
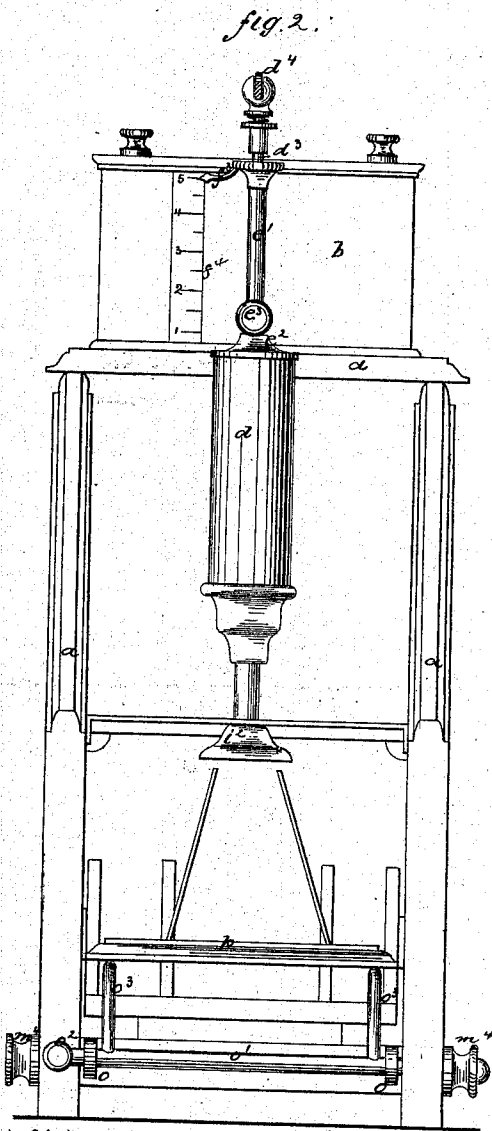
Inventor:

C. A. Gregory
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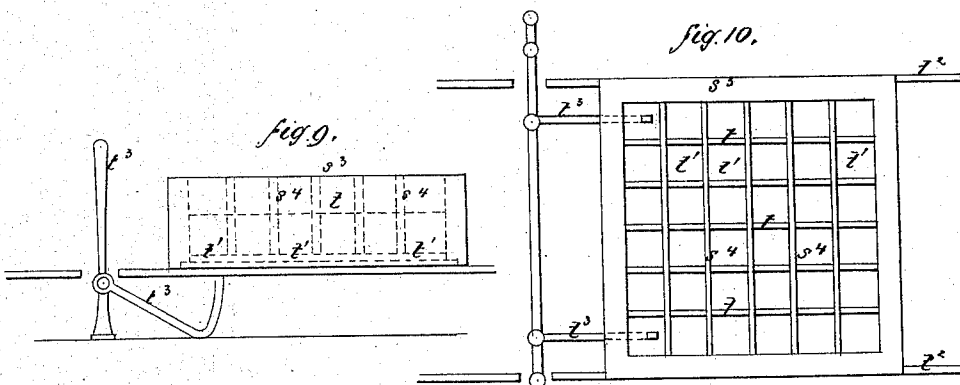
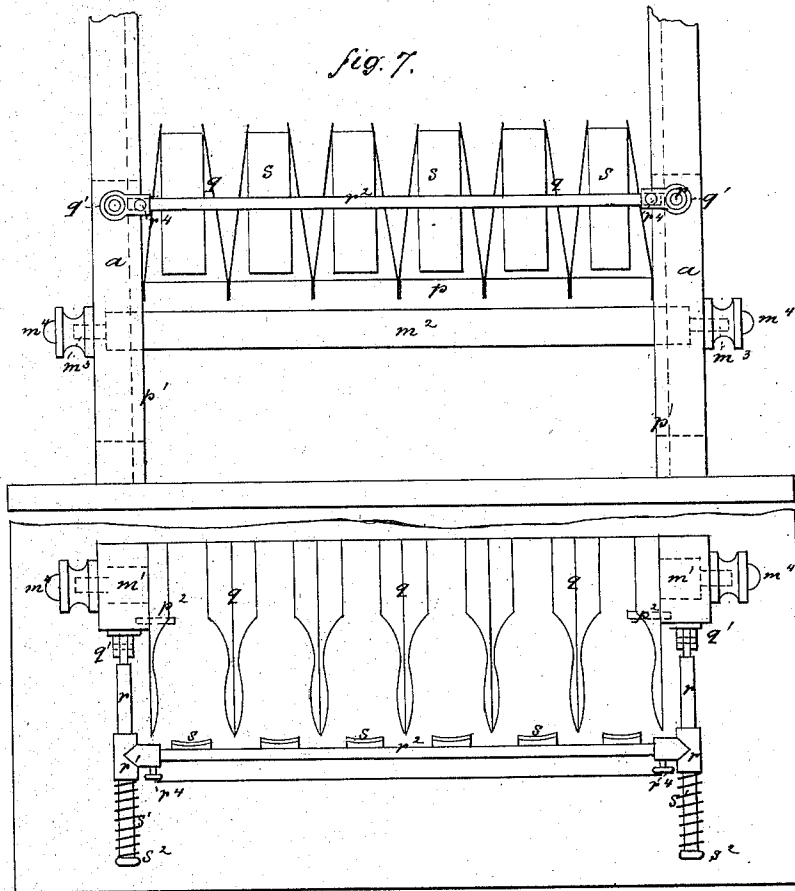
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United States Patent Office.

CHARLES ALEXANDER GREGORY, OF POUGHKEEPSIE, NEW YORK.

Letters Patent No. 105,328, dated July 12, 1870.

IMPROVEMENT IN BOTTLE-FILLING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, CHARLES ALEXANDER GREGORY, of the city of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Apparatus for Filling Bottles, Vials, and other vessels, and gauging their contents; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, in which—

Figure 1 represents a front elevation of the apparatus.

Figure 2 represents a side elevation of the apparatus.

Figure 3 represents a sectional elevation.

Figure 4 represents a sectional elevation of a modification.

Figures 5 and 6, details of the apparatus.

Figure 7 represents detail of the framing, &c.

Figure 8 represents plan of fig. 6.

Figures 9 and 10 represents details of the apparatus.

This invention has for its object the construction of a machine or apparatus for filling bottles, and by the use of which the labor of the ordinary way may be very much reduced, and loss by spilling or overflowing of the bottles be obviated.

In the drawing, similar letters of reference indicate corresponding parts.

The letter *a* is the frame-work, of any suitable construction, on the upper part of which the tank *b* is placed.

This tank is for the purpose of holding a supply of the fluid with which the bottles are to be filled. It is filled from time to time by the tin-dish *c*, fig. 3, or it may be provided with a pipe, valve, and float arrangement, *c' c'*, connected with any other suitable pipe, for conducting the fluid from a barrel or other reservoir, suitably situated above, and, by this arrangement, the level of the fluid in the tank *b* is maintained.

The bottom of the tank *b* is provided with an opening, to which is attached the pipe *c*, provided, as shown in fig. 2, with a valve, *c*, and valve-seat, *c'*, by which the cylinder *d* is filled as required.

The cylinder *d* is attached to and held in its proper position by any suitable means, together with the union joint *d'*, which couples the valve-seat and pipe *c* together.

In the bottom of this cylinder a valve, *d*, is placed, attached to a rod, *d*.

This rod extends up through the cylinder, and is attached to a lever, *d'*, situated above the top of the tank *b*, as shown in fig. 3, and will be hereinafter more particularly described.

The cylinder *d* is provided with a piston, *e*, to which

is attached a tube, *e'*, acting as a piston-rod, and at the same time allows the valve-rod *d* to slide up and down freely within it.

The cylinder *d* is also provided with a cover, *e*, with a neck extending upward, with the set-screw, *e'*, placed for the purpose of securing the rod *e'* and piston *e* in any desired position.

To the top of the rod *e'* is attached a cap, *f*, screwed onto it, and provided with packing, *f'*, to keep it air tight on the upper part of rod *d*.

To this cap is attached a pointer, *f'*, arranged to indicate, on a scale, *f'*, figs. 2 and 3, the area for fluid below the piston *e*.

The rod *d*, in its lower part, consists of a solid round rod, and in its upper part of a tube. At the point of junction the solid rod is made of any suitable configuration, to allow of the passage of air from the tubular upper part to the small space existing between the lower part *d* and tubular piston *e*, so that, as the fluid contained in the cylinder flows out when the valve *d* is lifted for that purpose, the air flows in through this opening.

On the top of the tank *b* a bracket, *g*, is placed, having two arms extending in a suitable manner, for the rods *d* and guide *g'* to pass through, and at the same time serving as guides for the same.

The ends are configured to receive the spiral springs *g*, which act on a collar, *g'*, on the rod *d*, and keep the valve *d* securely closed, and the spiral spring *h*, which acts on the bottom of the collar of the point *h'*, attached to the lever *d'*, and keeps the valve *c* open, the lever *d'* being supplied with a handle, *h*, for working the same.

The bottom *h* of the cylinder *d* extends downward, as shown in fig. 3, and to this extension, *h'*, is attached a yoke, *i*, provided with guide-bars *i'*, on which a funnel-guide, *i*, slides freely up and down.

Within the extension *h'* a suitable pipe, *i*, is attached, for the purpose of entering into the bottles or other vessels to be filled, there being a suitable space left for the escape of the air contained within the vessel filled, between the neck of the funnel *i* and pipe *i*.

In the modification shown in fig. 4, the same general principles exist, but with the following exceptions:

The apparatus is arranged for one given size or capacity of vessel to be filled, and is more particularly adapted for the purpose of filling beer-bottles, &c., the tank *b* being provided with a cylinder, *d*, attached immediately to it. This cylinder is made of the cubical capacity of the vessel to be filled, and at its bottom is provided with any suitable valve, *k*, which opens downward.

This valve is attached, by a rod, *k'*, to the cap *k*, of the form shown in the drawing.

The rod *k'* passes within a tube, *k*, which serves as

a piston-rod to the piston-shaped valve I attached to it, and made to form a cover to the top of the cylinder d , and, when pressed down on it, prevents the entry of any more fluid than that with which it is charged, the rod k either being made of smaller diameter than the inside of the pipe or piston-valve rod k , allows the air to pass down between the two, to fill the space as the fluid flows out of the cylinder by the pipe k , or part of the rod k may be reduced or cut away for this purpose, as shown in fig. 4.

Within the cap k a spiral spring, k , is placed, which acts on the bottom of the cap k and the top of a collar, I , attached to the rod k , and rests upon a suitably-formed collar-end of the arm I , attached to rock-shaft I , to the outer end of which is attached any suitable lever and handle, I , for working the same, the bottom of the cylinder being terminated in the form shown in the drawing, and provided with the parts i , i' , and i'' , described in fig. 3.

In both of the arrangements shown in figs. 3 and 4 but one cylinder is shown, but the apparatus may be constructed with any suitable number of them, each being provided with the various parts hereinbefore described, when the tank b may be open throughout, or may be divided into separate compartments for each cylinder.

The modification shown in fig. 3 may also be worked in the following manner, to accomplish the same purpose.

The valves c and d may be reversed, and to the piston e a solid piston-rod may be attached, connected to the lever d . By raising the piston in the cylinder, and causing the valve c to open, the fluid contained in the tank b will be drawn into the cylinder; when, by again pressing down the piston, the valve c closes, while d opens, and the fluid contained in the cylinder is forced out through the pipe i . In this case, the piston-rod will be provided with any suitable adjustable stops, whereby the length of the stroke may be regulated, and thus the measurement of the fluid discharged at each operation be obtained.

In figs. 5 and 6 is shown the detail of a modification of pipes i and k , for the purpose of obviating the difficulty found to exist in filling bottles, &c., with fluids inclined to froth or foam in so doing, and by which they are made to flow out of the pipe into the side of the vessel.

Figs. 7 and 8 show the arrangement of the lower part of the frame-work a , as adapted for filling six vessels simultaneously, the side elevation being similar to that of fig. 2.

In the two uprights suitable slots m are made, in which the ends of the bar m work, and are provided with screws m and nuts m , to secure it at any required height.

To this bar m are attached two arms or brackets, o , figs. 1 and 2, with the outer ends formed in the shape of eyes, wherein the shaft o is placed. This shaft is provided with a handle, o , at one end, and rotated by it, and in suitable positions with the arms o , acting on the bottom of a table, p , arranged to slide up and down between the uprights of the frame-work, by means of a groove, p , and corresponding guides p , attached to the table p .

Upon the upper side of this table are placed the springs q , for the purpose of holding the vessels to be filled in their proper position laterally, while to the uprights are attached two double eyes, q , figs. 1, 2, 3, and 4, with the ends of the rods r attached by means of a pivot, on which they freely rotate.

On these rods the sliding sockets r are placed, each provided with a projection for the reception of the ends of the cross-bar r , secured in any desired position by the set-screws r .

On the cross-bar r are placed six plates, s , attached to or forming part of it. On the end of the

rods r , extending beyond r , spiral springs s are placed, acting on r at one end, while the other end presses against a collar, s , screwed on the end of the rods r .

This cross-bar, with its various parts, is for the purpose of pushing the vessel to be filled and placed in front of each of the plates s into their proper positions under the pipes i and k , shown in figs. 3 and 6.

In fig. 10 is shown another modification for placing the bottles, and consists of any ordinary bottle-rack, s , made for any number of bottles, and divided by the strips s , extending the entire depth of the box or rack, while those in the other direction t are only about half the depth, the bottom being formed in separate parts t , placed between each of the divisions s . This box slides on suitable rails t , attached to the frame a .

A somewhat similar arrangement, t , to that shown at o , o' , and o'' , is also provided, by means of which each bottom, t , may be separately lifted to the height of the bottom of the division t , causing the necks of the bottles placed in it to enter the pipe m , i , or k , within them. This will also be provided with any suitable catch, to hold it in that position while being filled and lowered, after which the next row of bottles is brought to the required position by sliding the rack s on the rail t . When these are not used the apparatus is provided with suitable trays, shown at u , in fig. 2, on which the bottles filled are pushed by those about to be filled, by the bar r and plate s , shown in fig. 8. This tray rests on the back side of bar m , and is carried by any suitable support, u , toward its other extremity. The tray u may also be provided with any suitable sliding bar, to prevent the bottles, after being filled, from falling over.

Having now described the construction of my invention and its various modifications, I will now proceed to describe its operation, the apparatus having been arranged substantially as described, referring first to the modification shown in fig. 3.

The tank b having been filled in the manner described, and the piston e adjusted to the height required, the exact quantity to fill the vessel will be indicated by the pointer f on the scale f , and, being secured in this position by the set-screw e , the valve c being kept open, the fluid flows into and fills the cylinder up to the level of the bottom of the piston e , the air contained in the cylinder escaping, as before described, through the space existing in and between the rods d and e . The bottles or other vessels intended to be filled are now put in place, in the manner hereinbefore described, and raised by the action of the lever o , causing the pipe i to enter within them, in doing which the funnel-guide i assists in bringing them to the proper position, and slides upon the bars i to the required height. After this the handle h is raised, causing the valve c to close, and prevent any further flow of fluid from the tank b . By still further raising the handle, the valve d is opened, and the fluid contained in the cylinder flows out into the bottle, the air returning to fill the cylinder by the same passage as before described, in the rods d and e .

In the modification shown in fig. 4 the bottles are placed as before described, and the pipe k introduced into them. The tank b having been filled with fluid, and the piston-valve I open, it flows at once into and fills the cylinder d . By pressing down the handle h , it causes the valve l to close the top of the cylinder, and at the same time opens the valve k for the fluid contained in the cylinder to discharge into the vessels below, the air being admitted to fill the cylinder as the fluid discharges by the space existing between the rods k and k .

The machine is arranged with a number of cylinders and corresponding parts, and constructed to be operated simultaneously by one handle, and if the

bottles to be filled are not quite equal in capacity, so that they appear to be unequally filled, a second quantity may be added by pressing upon the cap k^4 above that particular bottle, by which the valve k is again opened, and any desired amount will flow out.

I am aware that apparatus has been invented and used for filling bottles, vials, &c., especially that for which Letters Patent of the United States were granted to me in the year 1860, but operating in a different manner, and substantially as follows:

The measuring-cylinders have but one capacity or measurement, and should any difference in the size of the bottles exist, so that one requires a little more to fill it, no arrangement is made by which that particular bottle can have an extra amount added without at the same time giving an equal portion to the others, which would cause them to overflow. This is provided for in the modification shown in fig. 4.

Again, in the apparatus as arranged in fig. 3 a greater difference exists, the cylinder being provided with a piston by which the portion of it to be used as a gauge may be varied, and thus any desired measurement within the limit of the capacity of the cylinder be obtained.

Having now described the construction and operation of my invention,

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The tank b , cylinder d , and connecting-pipe c , in combination with the valve c^2 , rod g^1 , valve d^2 , rod

d^2 , and lever d^4 , all arranged in the manner and for the purpose described.

2. The combination of the lever d^4 and rods d^2 and g^1 with the bracket g and springs g^2 and h , substantially as and for the purpose specified.

3. The combination of the adjustable piston e , rod e^1 , cap f , and scale f^1 , all working together substantially as described.

4. The pointer f^3 and scale f^4 , in combination with the piston e , rod d^2 , set-screw e^2 , and cylinder d , all working together in the manner and for the purpose specified.

5. The funnel-guide i^2 and guides i^1 , by which the neck of the bottle is caused to enter the pipe i^3 h^4 m , in combination with the cylinder d and valve d^2 , all arranged in the manner and for the purpose described.

6. The table p , provided with springs q , and fitted to slide vertically between the side pieces a of the frame-work, in combination with the lifting apparatus o o^1 o^2 o^3 , adjustable bar m^2 , set-screws m^1 , and slots m^1 , all arranged as and for the purpose specified.

7. The combination of the table p , springs q , double eyes q^1 , rods r , sockets r^1 , cross-bar r^2 , set-screws r^4 , plates s , springs s^1 , and collars s^2 , substantially as described.

CHARLES ALEXANDER GREGORY.

Witnesses:

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O. ROBINSON.