

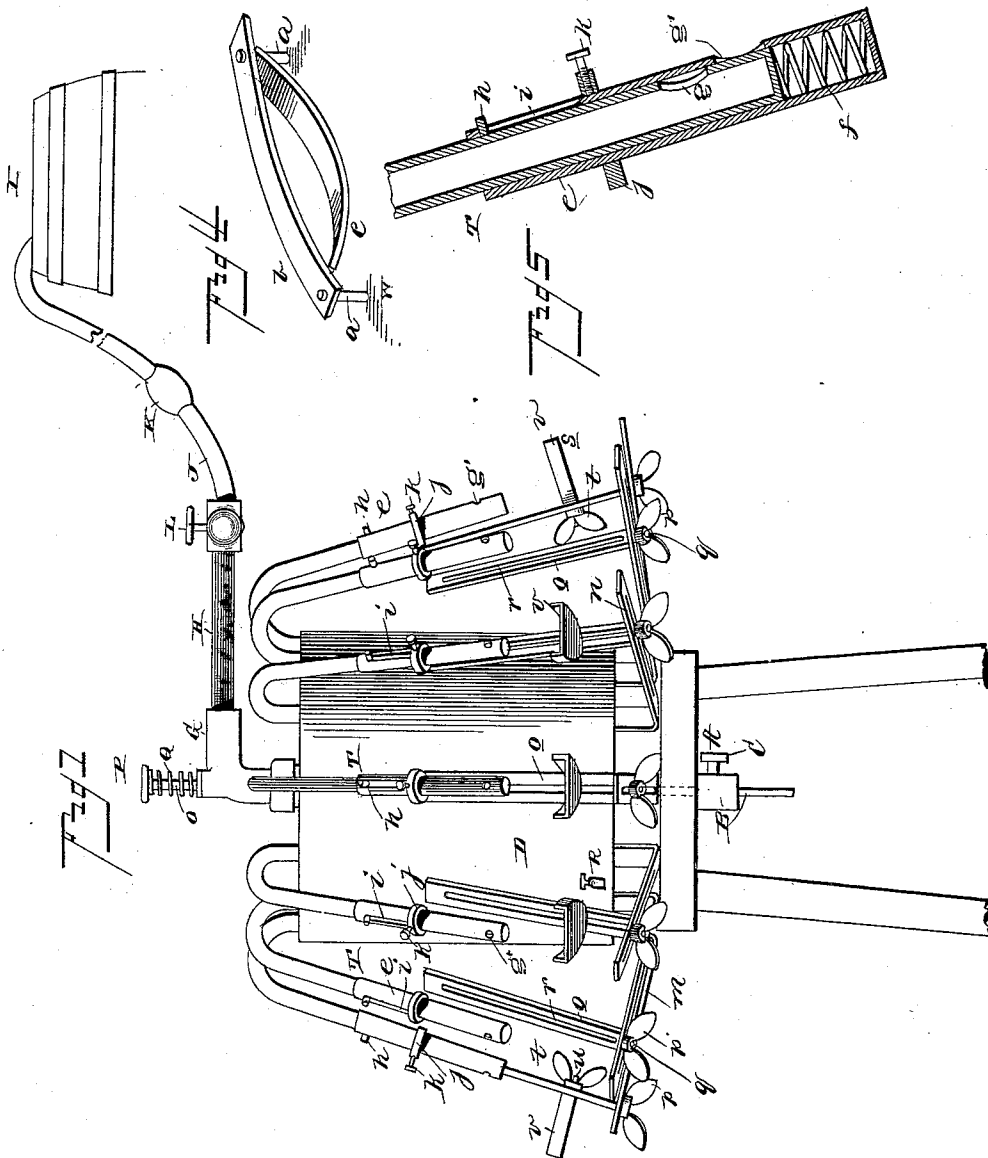
(No Model.)

* 2 Sheets—Sheet 1.

W. H. COMSTOCK.
BOTTLE FILLING MACHINE.

No. 425,659.

Patented Apr. 15, 1890.



Witnesses
John Mirie
Wm. Bagger.

Inventor
William H. Comstock

By his Attorneys
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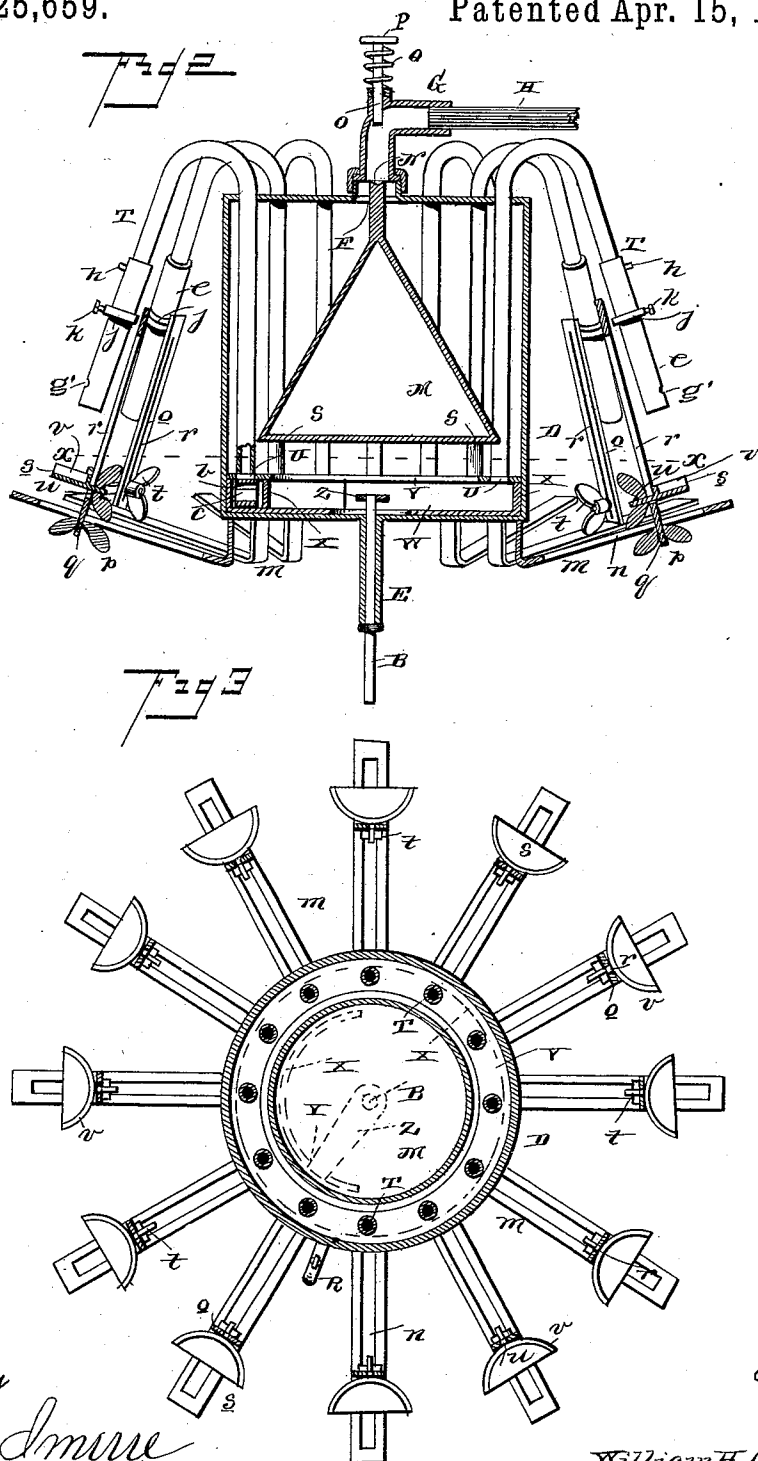
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UNITED STATES PATENT OFFICE.

WILLIAM HARLOW COMSTOCK, OF OSKALOOSA, IOWA.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 425,659, dated April 15, 1890.

Application filed April 5, 1889. Serial No. 306,057. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HARLOW COMSTOCK, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Bottle-Filling Machine, of which the following is a specification.

This invention relates to bottle-filling machines; and it has for its object to provide a device of this class which shall be simple in construction and which may be operated continually without stopping.

To this end the invention consists, essentially, in a revolving tank to which the liquid is conveyed from a suitable cask or vessel, said tank being provided with a series of siphons through which the liquid is drawn up into the bottles, which are meanwhile placed upon adjustable supports beneath the said siphons.

The invention further consists in an improved mechanism for starting the liquid to flow in all of the said siphons simultaneously.

The invention further consists in the mechanism for cutting off the flow of the liquid automatically when it has reached the proper level in the bottles which are to be filled.

The invention further consists in certain improvements in the construction of the valves for closing the mouths of the siphons when the bottles have been moved to the front, and an automatic valve or cut-off to close the inner end of the siphon, which is temporarily at the front of the casing, while the bottle is being removed and another one replaced on said siphon.

The invention further and finally consists in the improved construction, arrangement, and combination of details, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side view of a bottle-filling machine embodying my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal sectional view taken on the line *xx* of Fig. 2. Fig. 4 is a perspective detail view of the automatic valve or cut-off for the inner ends of the siphons. Fig. 5 is a sectional view, on a larger scale, of one of the siphons.

The same letters refer to the same parts in all the figures.

A designates a suitable stand or support, which is provided with an upwardly-extend-

ing vertical stem or spindle B, which may be vertically adjusted by means of the set-screw C.

D represents a cylindrical tank of suitable dimensions, which is provided with a central downwardly-extending tubular bearing E, through which the stem or spindle B extends into the said tank, which latter is thus made revoluble upon the said spindle.

A packing-box of suitable construction may be employed for the purpose of making a tight joint between the spindle B and tube E; but this I have not shown in the drawings hereto annexed.

The upper end of the tank D has a centrally-located opening F, which is connected by a swivel-joint of suitable construction with an elbow G, to the horizontal arm of which is connected a tube H, of glass or other suitable transparent material. The outer end of the glass tube H is connected with the cask I from which the liquid is to be drawn by means of an elastic tube J, having a bulb K suitably formed thereon. A stop-cock L of suitable construction serves to regulate the admission of the fluid from the flexible tube J into the glass tube H and from thence into the tank.

M designates a float arranged within the tank D and having a conical upper end, which constitutes a valve adapted to close the opening F, which is ground to form a valve-seat, when the said valve or float rises in the tank. The apex of the conical valve M has a concave-faced disk or button N, adapted to be engaged by a spindle or rod O, sliding vertically in the elbow-joint G, above which it extends. The upper end of the stem O is provided with a button or handle P, and a spring Q coiled around the said stem and bearing against the under side of said button or handle serves to force it automatically in an upward direction. A pet cock R, arranged at the bottom of the tank D, serves to enable the contents of the latter to be drawn off when desired. The bottom of the float or valve M is provided with downwardly-extending legs S to keep the said float or valve at all times sufficiently raised from the bottom of said tank.

T T designate a series of siphons mounted in the top of the tank, near the periphery of the same, at equal distances apart. Any desired number of these siphons may be used, according to the desired capacity of the ma-

chine; but twelve will be found a convenient and desired number. The inner ends of said siphons extend nearly to the bottom of the tank, where they are connected with openings U in a horizontal annular flange V, secured to the inside of said tank a short distance above the bottom. The outer ends of arms of the siphons are inclined downwardly and outwardly from the top of the tank, as will be clearly seen in Fig. 1 of the drawings.

W designates an annular disk or plate fitting upon the bottom of the tank, and provided with upwardly-extending concentric annular flanges X X, one of which is provided with a notch Y, into which extends an arm Z, which is firmly secured upon the upper end of the spindle B, upon which the tank is mounted. It will thus be seen that when the tank G is rotated the annular disk W, with its attachments, will be retained securely in position. Extending upwardly from the disk W at a point which corresponds with the front of the machine are two pins *a a*, upon which is mounted a vertically-sliding plate *b*, which is forced in an upward direction by means of a spring or springs *c*, suitably arranged under the said plate. It will be seen that the pressure of the springs *c* automatically forces the plate or valve *b* upwardly against the under side of the annular flange V in the tank, thus causing the said valve to close the lower end of the siphon connected with the opening U in said flange, with which the said valve at any given time registers, and consequently cutting off the flow of liquid through said siphon.

The ends of the outer arms of the siphons T are closed, and the said siphons are provided near their outer ends with openings *g* for the escape of the fluid. Tubes *e*, likewise closed at their lower ends, are arranged to slide upon the outer arms of the siphons T, upon which they are closely fitted, so as to prevent the escape of fluid between the said tubes and siphons. Coiled springs *f* are interposed between the outer ends of the siphons and the tubes *e*, which latter are thereby forced in a downward direction. The tubes *e* are provided with perforations *g'*, which, when the said tubes are raised against the tension of the springs *f*, are adapted to register with the perforations *g* in the siphons. The latter are provided with pins *h*, extending through slots *i* in the tubes *e*, said slots being of such length as to cause the perforations *g* to register when the tubes *e* are pushed in an upward direction to the limit of the slots *i*. The pins *h* further serve to retain the tubes *e* in position upon the siphon-arms. The tubes *e* are provided with flanges or collars *j*, adjustable by means of said screws *k*. It will be seen that the springs *f* normally force the tubes *e* in a downward direction, thereby closing the openings *d* of the siphons. Said openings may readily be made of a size equal to the interior diameter of the siphon-tubes, so that the flow of liquid through the said siphons

shall not be retarded. When bottles are adjusted upon the siphon-tubes, the collars or flanges *j* will be so adjusted as to be engaged by the mouths of the bottles, which will thus force the tubes *e* in an upward direction and cause the openings *d g* to register with each other, and thereby opening the siphons for the passage of fluid.

The lower end of the tank is provided with a series of radial outwardly-extending brackets *m*, having slots *n*, in which the upwardly-extending arms *o* are adjustable by means of thumb-nuts *p*, working upon screw-threaded rods *q*, that extend from the said arms downwardly through the slots *n*. The vertical arms *o* are provided with slots *r*, in which the semicircular shoes or bottle-holders *s* are vertically adjustable by means of thumb-nuts *t*, working upon screw-threaded rods or extensions *u* of the said shoes or bottle-holders. The latter are provided with flanges *v*, against which the bottles may rest when they are placed in position. It will be seen that by the slotted brackets *m* and arms *o* the shoes or bottle-holders may be adjusted with regard to the diameter and height of the bottles which are to be filled, so as to bring said bottles in proper position with relation to the siphons, while the flanges or collars *j* upon the valve-tubes of said siphons may be properly adjusted, as herein described, to be engaged by the mouths of bottles of any height.

The operation of my invention is as follows: The bottles which are to be filled are first arranged upon the shoes *s* under each of the siphons, which is caused to enter the corresponding bottle, the mouth of which engages the flange or collar *j* of the valve *q* of the siphon, which is thus forced in an upward direction, causing the openings *d* and *g* to register with each other. The end of the tube J is inserted through the bung-hole of the cask or barrel the contents of which are to be bottled, and the cock or valve L is opened. The bulb K is now compressed to expel the air from the tube J. When pressure upon the bulb is released, the fluid will be started to flow from the barrel through the tube J, valve L, and glass tube H into the cylindrical tank D. When the fluid rises in the said tank, the conical float or valve M is carried in an upward direction until, when the fluid reaches the level in the tank which corresponds to the level to which it is intended to rise in the bottles that are to be filled, the said conical float or valve reaches its seat, and consequently cuts off the flow of liquid into the tank. The bottles to be filled being now in position, as already described, the stem or rod P is forced in a downward direction, thus depressing the float M, causing it to displace the liquid contained in the tank D and force it through the siphons T, the flow in which is thus started. As fast as the liquid enters the bottles through the siphons T the contents of the tank will be replenished from the source of supply,

the float or valve M serving merely to cut off the flow when the contents of the tank reaches the level corresponding with the level to which the bottles are to be filled, thereby preventing overfilling of the bottles and the waste consequent thereupon. The operator, standing in front of the machine, now removes one bottle after another, replacing it with an empty one, and meanwhile revolving the casing or tank, so that he need not shift his position by going from one supply spout or siphon to another. Every time a bottle is removed the valve-tube *e* of the siphon is automatically forced in a downward direction, so as to close the escape-opening of said siphon, and by the act of replacing an empty bottle the said valve-tube is forced upward, so as to automatically open the valve. It will also be seen that the inner end of the siphon from which the bottle is removed by the operator registers at the time with the valve or plate *b*, which closes the inner end of the siphon which is at the front of the machine only, thus permitting the unobstructed flow of liquid through the remaining siphons. This valve *b* forms a safety-valve in case the valve-tube upon the outer end of the siphon should fail to work; and, inasmuch as it is not absolutely necessary to cut off the flow in any of the siphons except the one from which the bottle is being removed for the purpose of replacing it with an empty one, I may entirely dispense with the valve-tubes upon the outer ends of the siphons, relying upon the valve *b* alone. The glass tube H, through which the liquid flows into the tank, enables the operator who stands in front of the machine to watch the condition of said liquid and to shut off the flow when it shows any signs of becoming cloudy or muddy, thereby saving the time which would otherwise be occupied in draining off the contents of the tank and cleaning the same; and I would here state that the tank or casing may, when-desired, be provided with a suitable hand-hold or with a detachable bottom, in order to enable it to be readily cleaned when necessary.

I have herein described the preferred construction of my improved bottle-filling machine; but I would have it understood that I do not limit myself to the precise construction of details herein shown and described, but reserve the privilege of making any modifications and alterations which may be resorted to without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. In a bottle-filling machine, the combination of a revoluble tank or cylinder having an opening in its upper side, a swiveled elbow-joint connecting said opening with a supply-pipe, a stem or rod moving vertically in said elbow-joint, a spring to force said stem normally in an upward direction, a conical float or valve adapted to close the inlet-opening in the top of the tank and to be engaged by the

vertically-sliding stem, and a series of circumferentially-arranged tubes or siphons closed at their outer ends and provided near their outer ends with suitable openings, and tubes sliding upon the outer ends of said siphons and having openings adapted to register with the escape-openings of the latter, substantially as set forth.

2. The combination of the revoluble tank or cylinder having an opening in its upper side, a swiveled elbow-joint connecting said opening with a supply-pipe, a stem or rod moving vertically in said elbow-joint, and the conical float or valve adapted to close the opening in the top of the tank or cylinder and to engage the lower end of the vertically-sliding stem or rod, substantially as set forth.

3. The combination of the revoluble tank having a central opening in its upper side, a swiveled elbow-joint connecting said opening with the supply-pipe, the vertically-sliding stem forced upwardly by a suitably-arranged spring, and the conical float or valve having a concave-faced disk or button at its apex to engage the lower end of said stem or rod, substantially as herein set forth.

4. The combination of the revoluble tank or casing having a circumferential series of escape tubes or siphons, the inner ends of which are connected with openings in a horizontal annular flange near the bottom of said tank or casing, an annular disk or plate arranged in the bottom of said tank, means for retaining said disk stationary when the said tank is rotated, pins or guides extending upwardly from said disk, and a plate or valve mounted upon said pins or guides forced upwardly by a suitably-arranged spring or springs and adapted to close the lower end of the siphon registering therewith, substantially as herein set forth.

5. The combination of the revoluble tank or casing, the stem or spindle extending through a tubular bearing in the bottom of said tank, an annular plate or disk arranged in the bottom of said tank and provided with annular flanges, an arm extending horizontally from the upper end of the stem or spindle and resting in a notch in one of the said flanges, a valve or plate arranged between said flanges and forced upwardly by means of a suitably-arranged spring against the under side of an annular horizontal flange near the bottom of the casing, and the circumferentially-arranged escape tubes or siphons having their inner ends connected to openings in the said horizontal annular flange, substantially as and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM HARLOW COMSTOCK.

Witnesses:

W. R. LACEY,
CHS. BLATTNER.