(No Model.)

C. S. DOLLEY.

BOTTLE FILLING MACHINE.

No. 582,623. Patented May 18, 1897.

FIG. 1

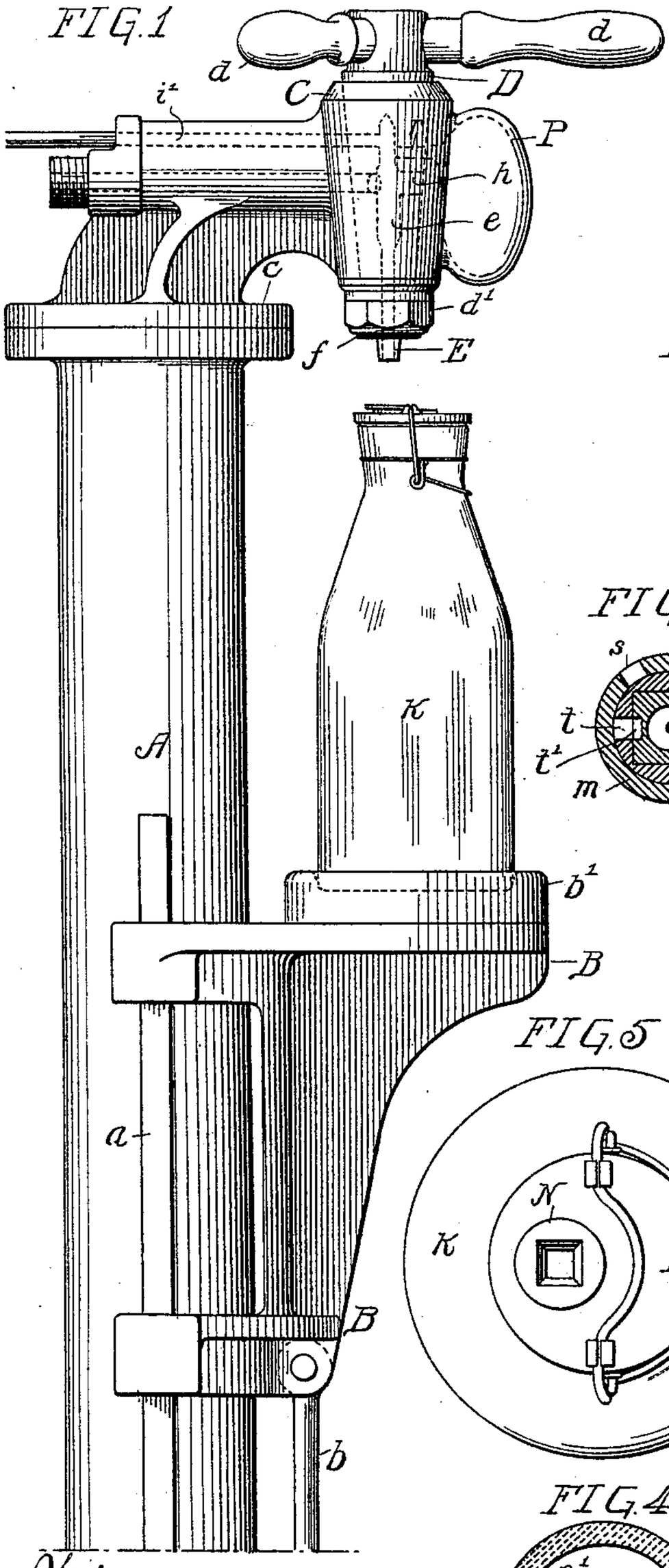


FIG. 2

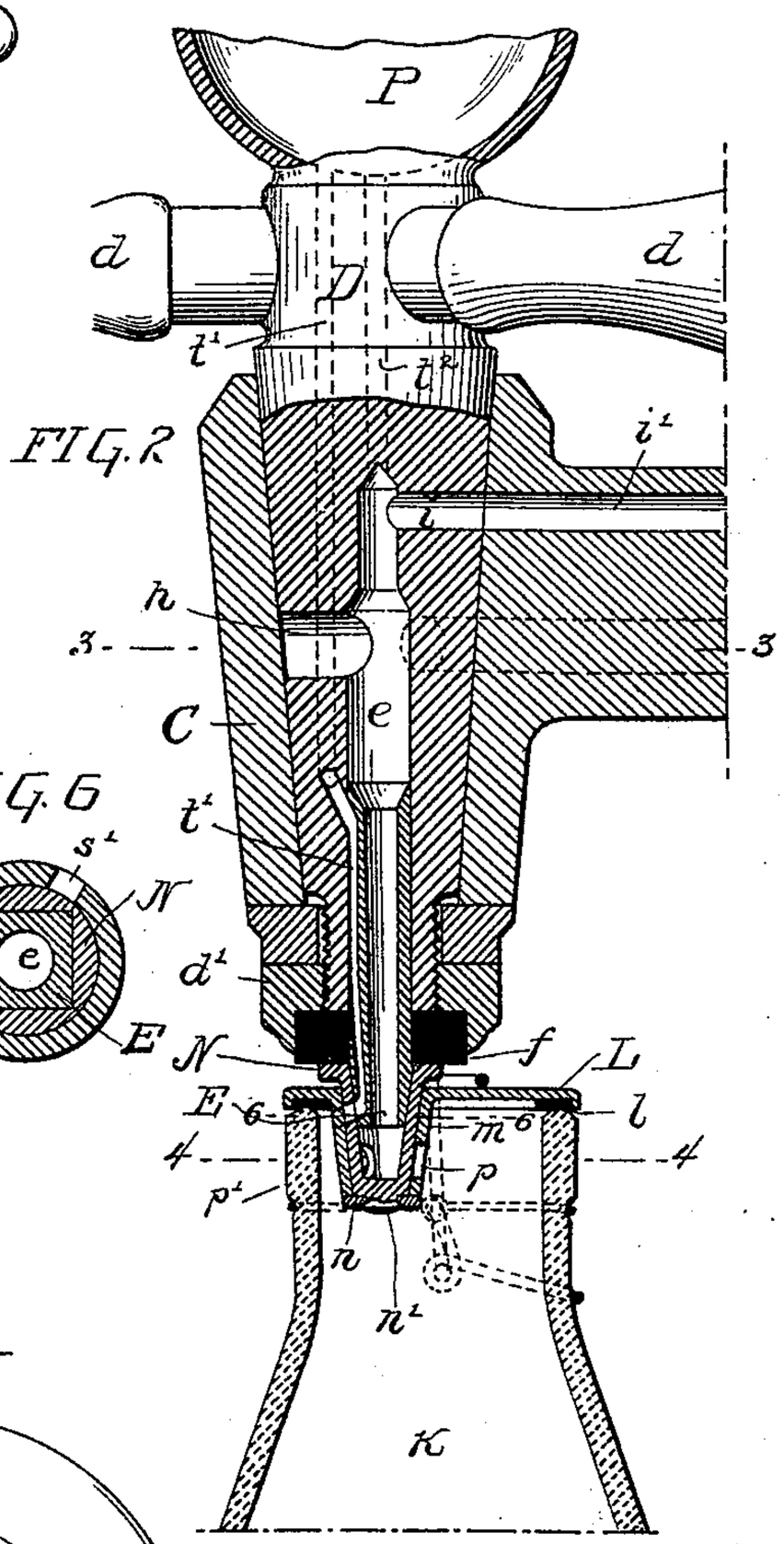


FIG. 6

FIG. 5

FIG. 4

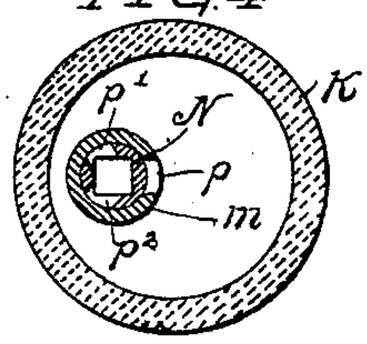
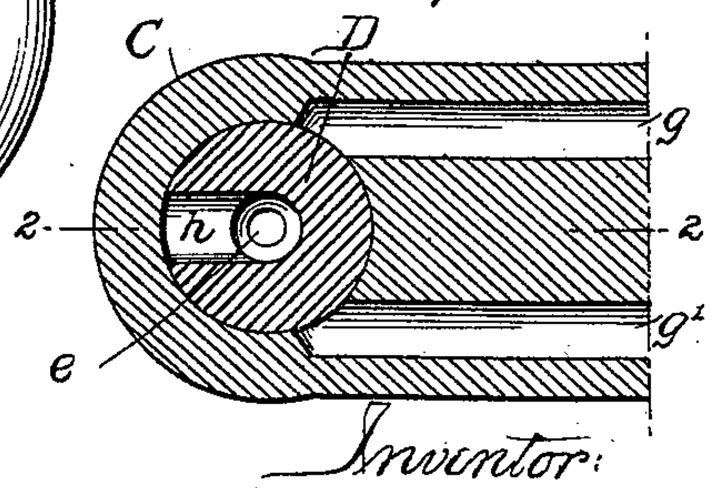


FIG. 3



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UNITED STATES PATENT OFFICE.

CHARLES S. DOLLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE UNIVERSAL FOOD AND LIQUID IMPROVING COMPANY, OF SAME PLACE.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,623, dated May 18, 1897.

Application filed April 25, 1896. Serial No. 589,023. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. DOLLEY, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in machines or apparatus for the filling of bottles with liquid either in a "flat" condition or under pressure, as desired, and relates particularly to the bottling of milk, wine, beer, fruit juices, and liquids of similar character, where it is desirable that the liquids should be bottled without admixture with air.

In the accompanying drawings, Figure 1 is an elevation of a bottling-machine constructed in accordance with my invention. Fig. 2 is a sectional elevation of the same on the line 2 2, Fig. 3, drawn to a somewhat larger scale in order to better illustrate the details of construction and illustrating the gas-chamber arranged in a different position. Fig. 3 is a sectional plan view on the line 3 3, Fig. 2. Fig. 4 is a sectional plan view of the bottle on the line 4 4, Fig. 2. Fig. 5 is a plan view of the bottle or jar to be used in connection with this machine; and Fig. 6 is a sectional plan view, on an enlarged scale, on the line 6 6, Fig. 4.

Referring to the drawings, A represents a suitable standard having guideways *a*, on which is mounted a platform B, connected by a rod *b* to a pedal or other suitable device for effecting the raising and lowering of the platform on the guides. On this platform is a block *b'*, having a central depression or recess for the reception of the bottom of the bottle to be filled.

At the top of the standard A is secured the base-plate *c* of a valve-casing C, in which is a conical valve D, provided with preferably three operating-handles *d*, consecutively numbered. This valve is held to its seat by a nut *d'* and is provided with a vertically-arranged central passage *e*, in which is fitted a nozzle E, securely held in position in the valve and having a central passage extending throughout its entire length and in communication with the central passage *e* of the valve.

That portion of the nozzle E which projects below the valve-casing is preferably squared or hexagonal in form and is adapted to fit within and form a key for the turning of a valve provided in the lid of the jar, bottle, or other receptacle to be filled, as more particularly referred to hereinafter, and in order to prevent any danger of leakage the lower face of the nut *d'* is recessed for the reception of a block *f*, of rubber or other suitable compressible material, which is pressed firmly against the top of the jar or bottle during the filling operation.

In the main portion of the valve-casing are two parallel passages *g g'*, the passage *g* being in communication, through a suitable connecting-pipe, with an exhausting-pump or vacuum-chamber and the passage *g'* being connected by a suitable pipe to a tank or other vessel containing a supply of the liquid with which the bottle is filled. In the conical valve is formed a horizontal passage *h*, extending from the central passage *e* to the exterior of the valve and arranged on the same horizontal plane as the passages *g g'*, so that the turning of the conical valve by the handles *d* will first place the passage *h* in communication with the passage *g* and draw from the bottle any air which it may contain, and a further partial turn of the valve will then bring said passage *h* into communication with the passage *g'* and permit the flow of liquid into the bottle or jar.

When the valve is in the position shown in Fig. 3, all communication between the passages *g g'* and the central passage *e* is cut off, and it will be noticed that the position of the various passages is such that one-third of a revolution of the valve will open communication with the passage *g*, another third of a revolution will open communication with the passage *g'*, a further third of a revolution will bring the port *h* of the valve back to its initial position, and as there are three of the operating-handles *d* the operator may grasp one after the other, moving each one to the same position and making certain the position which the port *h* will assume.

In the valve attached to or forming part

of the bottle and also in the passage-way *e* there is some danger of the accumulation of fermentation germs, and to thoroughly clean and sterilize these portions I continue the passage *e* up into the body of the valve and form a port *i* from the central portion of the valve to the periphery thereof, which port is normally in communication with a passage *i'*, connected by a suitable pipe to a steam-supply and so arranged that when the valve is in its normal position a small quantity of steam will constantly fill the passage-way *e* and be escaping from the end of the nozzle E, but so soon as the valve D is turned communication with the steam-supply is cut off and the valve opens communication with an air-exhaust. If desired, the flow of steam need not be constant, as the passages *i i'* may be so arranged as to be normally disconnected and to be placed in communication with each other by the first partial turn of the valve D.

The bottle or jar K is of any ordinary character and is provided with a cap or cover L, having a packing-ring *l*, of rubber or other suitable material, which comes into contact with the top edge of the bottle, the cover having the usual connecting-bail for the purpose of keeping it in the closed position, or it may be secured by other suitable means.

The cap L has a conical flange *m*, forming a valve-casing for the reception of similarly-shaped valve N, held in position by a disk *n*, through which passes a rivet-head *n'*, which may form a part of the body of the valve. The top of the valve N has a horizontal flange which is seated against the rubber block *f* when the bottle is being filled, and the central portion of the valve is of a shape corresponding to the shape of the nozzle B—that is to say, square or hexagonal or otherwise adapted to the shape of the keyed end of the nozzle E and slightly tapering, so that it may perfectly fit to said nozzle without danger of leakage. In the valve-casing *m* is a port *p*, and in the valve proper are two ports *p' p²*, the relative positions of the ports being such that on the turning of the valve D to a position which will open communication between the passage *g* and the port *h* the nozzle E will have turned the valve N to such position as to open communication between the port *p'* of the valve and the port *p* of the valve-casing, and, similarly, when the valve D is in position to make communication between the passage *g'* and the port *h* the ports *p²* and *p* will be in communication.

When the bottle or other receptacle is being filled with liquid under pressure of a gas, it is found in machines of the ordinary construction that when the bottle is nearly full the pressure of gas in the bottle is equal to that in the tank or other supply vessel and the flow of liquid will cease, making it impossible to entirely fill the bottle.

To provide for the escape of the accumulated gas without losing the effect of its pressure on the liquid, I provide on my improved apparatus a gas bulb or receiver P, which may be arranged in front of the valve-casing C, as shown in Fig. 1, or on top of the valve D, as illustrated in Fig. 2, the capacity of the bulb or receiver being less than the capacity of the bottle or jar being filled, so that said receiver will accommodate only a portion of the gas which passes with the liquid into the bottle, and thus regulate and preserve the pressure of the gas on the liquid. If the receiver were sufficiently large to take up all of the gas passing into the bottle, this effect would be lost and the bottle would be filled practically *in vacuo*.

In the construction shown in Fig. 1 the receiver P communicates at all times with the central passage *e* by means of a horizontal port *r*, and when the gas commences to accumulate it passes into this receiver instead of remaining in the bottle and preventing the filling of the latter with liquid.

The structure illustrated in Fig. 2 is deemed the preferable one, however, as it is designed to remove the gas directly from the top of the bottle being filled. In this construction the flange *m* of the cap L is provided with two ports *s s'*, and the valve N has a port *t*, which is placed in communication with the port *s* when the bottle is being exhausted and then with the port *s'* when the bottle is being filled with liquid.

The nozzle E is provided with a passage *t'*, the lower end of which communicates with the port *s* when the nozzle is inserted in the valve N and the upper end of which communicates with the receiver P on top of the valve D.

In some cases the receiver P may have a passage *t²* communicating directly with the central passage *e*, as shown by dotted lines in Fig. 2.

In operation, considering the valve D to be in its normal closed position, a bottle to be filled is placed on the block *b'*, the cap or cover of the bottle being locked tightly in place. The platform B is raised until the nozzle E has slightly entered the valve N, the flow of steam through the passages *i* and *i'* acting to remove any impurities which may have accumulated, as described. The platform B is raised until the nozzle E has fully entered the valve N, and the operator grasps one of the handles *d* and turns the valve D and, through the nozzle E, the valve N of the bottle until the ports *g* and *h* are in communication with each other and the ports *p' p* and the ports *s t* of the bottle are also in communication. The air then contained in the bottle is removed by the exhausting apparatus until a nearly perfect vacuum is formed, and at the same time the air in the receiver P is exhausted through the passage *t'* and ports *t s* and in some cases partly through the passage *t²*. A further turn of the valve D brings the passage *g'* and the port *h* of valve D and ports *p² p* and ports *s' t* of the valve N in communication with each other, permit-

ting the milk or other liquid to flow into the bottle without contact with the air and either in a flat condition or mingled with and under the pressure of carbonic-acid gas, oxygen, or other suitable gas. If the liquid is under pressure of a gas, the gas will first accumulate in the top of the bottle and will then pass through the ports *s'* and *t* and by way of passage *t'* to the receiver P, so that the bottle may be entirely filled. A further turn of one of the handles *d* brings the valves D and N back to their original positions, when the platform B may be lowered and the bottle removed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the filling-nozzle having a keyed periphery, a liquid-receptacle, and a hollow valve in said liquid-receptacle adapted to receive and to be turned by said keyed nozzle.

2. The combination of the filling-nozzle having a keyed periphery, a liquid-receptacle having a cap or cover, and a hollow valve in said cap or cover adapted to receive and to be turned by said keyed nozzle.

3. The combination of the liquid-supply, a receptacle, a controlling-valve between the two, a gas or air receiver in communication with the receptacle but of less cubic contents than the receptacle, and an air-exhaust adapted to create a partial vacuum in the receptacle and the receiver before the flow of liquid commences, substantially as specified.

4. The combination of the liquid-supply, a receptacle, a controlling-valve between the two, a discharge-nozzle on the valve leading to a point within the receptacle to be filled, and a gas or air receiver of less cubic contents than the receptacle, there being a passage leading therefrom to the receptacle entirely independent of the liquid-passage, substantially as specified.

5. The combination in a bottle-filling apparatus, of a valve-casing having ports, a ported valve within said casing, a nozzle projecting from said valve and having a keyed periphery, a bottle cap or cover, a valve-casing secured to or formed integral with said cap or cover and a hollow valve provided within said valve-casing and adapted to receive and to be operated by said projecting nozzle.

6. The combination in a bottle-filling apparatus, of a valve-casing having ports or passages in communication with an air-exhaust and with a liquid-supply respectively, a valve having a central passage, a transverse port extending between said passage and the periphery of the valve, a projecting nozzle having a squared or keyed periphery, a bottle cap or cover, a valve-casing secured to or formed integral with said cap or cover and having a single port formed therein, a hollow valve adapted to said valve-casing, ports provided therein, said valve having its inner surface of a contour corresponding to the projecting nozzle and adapted to receive and to be operated by said projecting nozzle, substantially as specified.

7. The combination in a bottle-filling apparatus, of a valve-casing having ports or passages in communication with an air-exhaust and with a liquid-supply respectively, a valve having a central passage, a transverse port extending between said passage and the periphery of the valve, a steam-supply passage in the valve-casing, a steam-port formed in the valve between the central passage and the periphery thereof, a projecting nozzle having a squared or keyed periphery, a bottle cap or cover, a valve-casing secured to or formed integral with said cap or cover and having a single port formed therein, a hollow valve adapted to said valve, ports provided therein, said valve having its inner surface of a contour corresponding to the projecting nozzle and adapted to receive and to be operated by said projecting nozzle, substantially as specified.

8. The combination of the valve-casing, C, having passages *g*, *g'*, a handled valve, D, having a central passage, *e*, and a port, *h*, a nozzle, E, projecting from the valve and having a squared or keyed periphery, a bottle or jar, a cap or cover, L, thereon, a valve-casing, *m*, on said cap or cover and having a port, *p*, a hollow valve, N, adapted to said valve-casing and having ports, p', p^2, the inner surface of said valve being of a shape corresponding to the periphery of the nozzle, E.

9. The combination of the valve-casing, C, having passages, *g*, *g'*, a handled valve, D, having a central passage, *e*, and a port, *h*, a nozzle, E, projecting from the valve and having a squared or keyed periphery, a bottle or jar, a cap or cover, L, thereon, a valve-casing, *m*, on said cap or cover and having a port, *p*, a hollow valve, N, adapted to said valve-casing and having ports, p', p^2, the inner surface of said valve being of a shape corresponding to the periphery of the nozzle, E, a port, *i*, formed in the valve, D, and a passage, *i'*, in the valve-casing, substantially as specified.

10. The combination of the valve-casing, C, having passages *g*, *g'*, a gas-receiver, a handled valve, D, having a central passage, *e*, a gas-passage, *t'*, and a port, *h*, a nozzle, E, projecting from the valve and having a keyed periphery, the passage, *e*, extending down through and terminating at end of said nozzle and the passage, *t'*, terminating at one side thereof, a bottle or jar, a cap or cover, L, thereon, a valve-casing, *m*, thereon, and having ports, *p*, *s*, and *s'*, a hollow valve, N, adapted to said valve-casing and having ports, p', p^2 and *t*, the inner surface of said valve being of a shape corresponding to the periphery of the nozzle, E, substantially as specified.

11. The combination of the valve-casing having passages in communication with the air-exhaust, liquid-supply, and steam-supply, respectively, a conical valve in said casing,

a projecting nozzle on said valve, there being a central vertically-disposed passage, *e*, extending through the nozzle and partly through the valve and said valve having ports, *h*, *i*, leading from said vertical passage to the periphery of the valve, a bottle cap or cover, a ported valve provided therein, said ported valve being adapted to receive and to be turned by said projecting nozzle, substantially as specified.

In witness whereof I have hereunto set my hand this 10th day of April, A. D. 1896.

CHARLES S. DOLLEY.

Witnesses:

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JNO. STEELE.