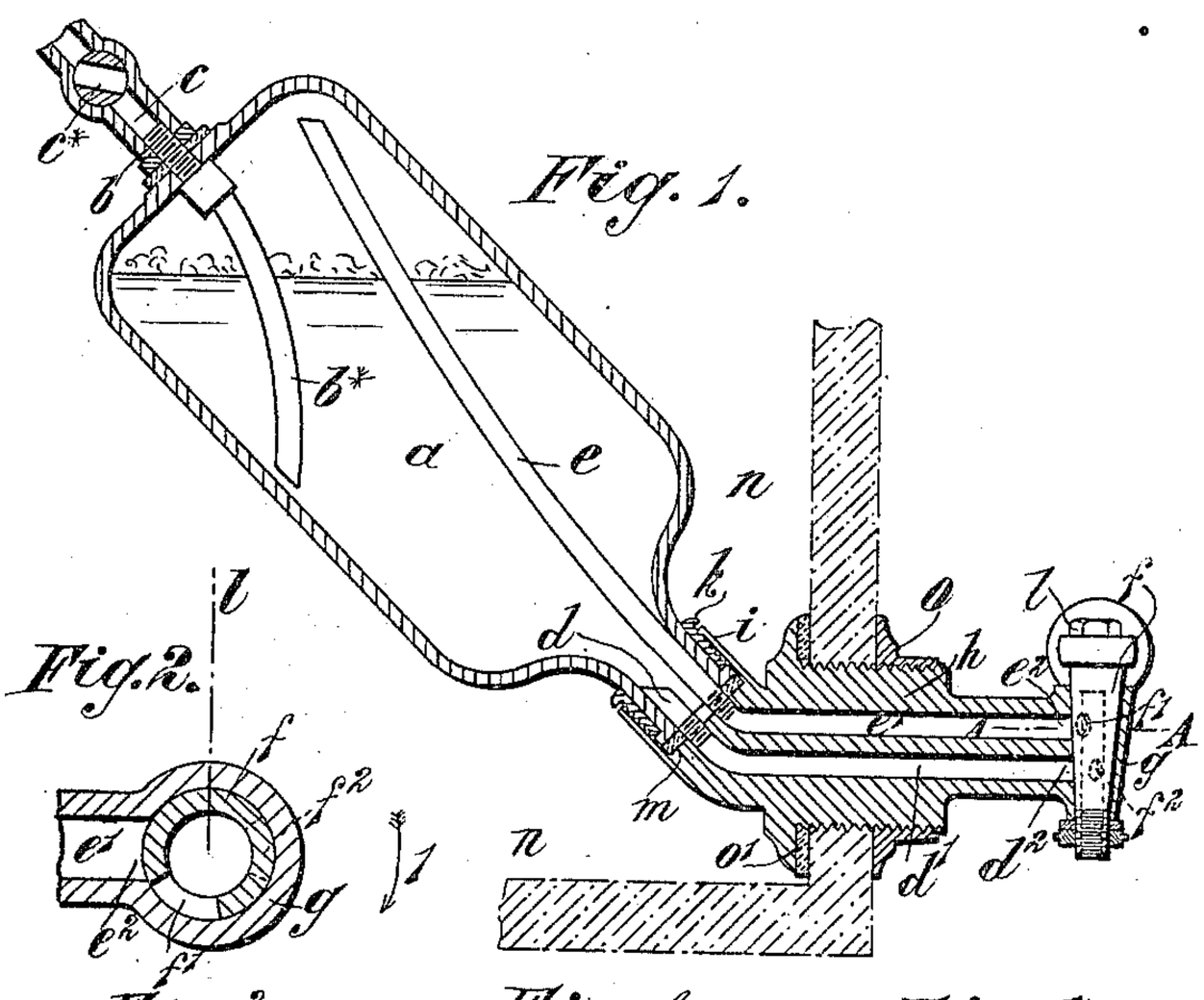
No. 688,586. Patented Dec. 10, 1901.

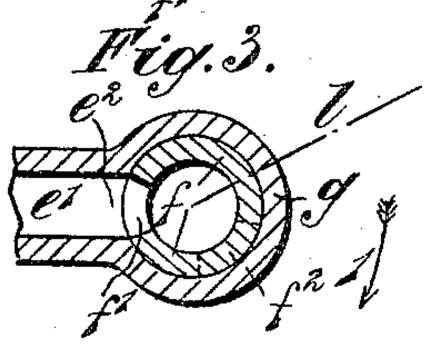
A. BRAKE.

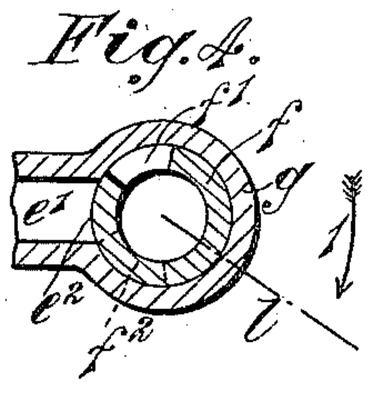
APPARATUS FOR DRAWING OFF LIQUIDS.

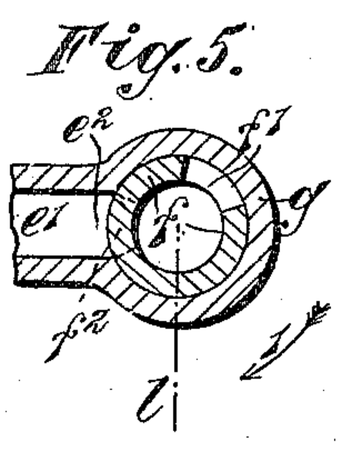
(Application filed Aug. 26, 1901.)

(No Model.) 2 Sheets—Sheet 1.









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(No Model.) 2 Sheets—Sheet 2.

Fig. 6.

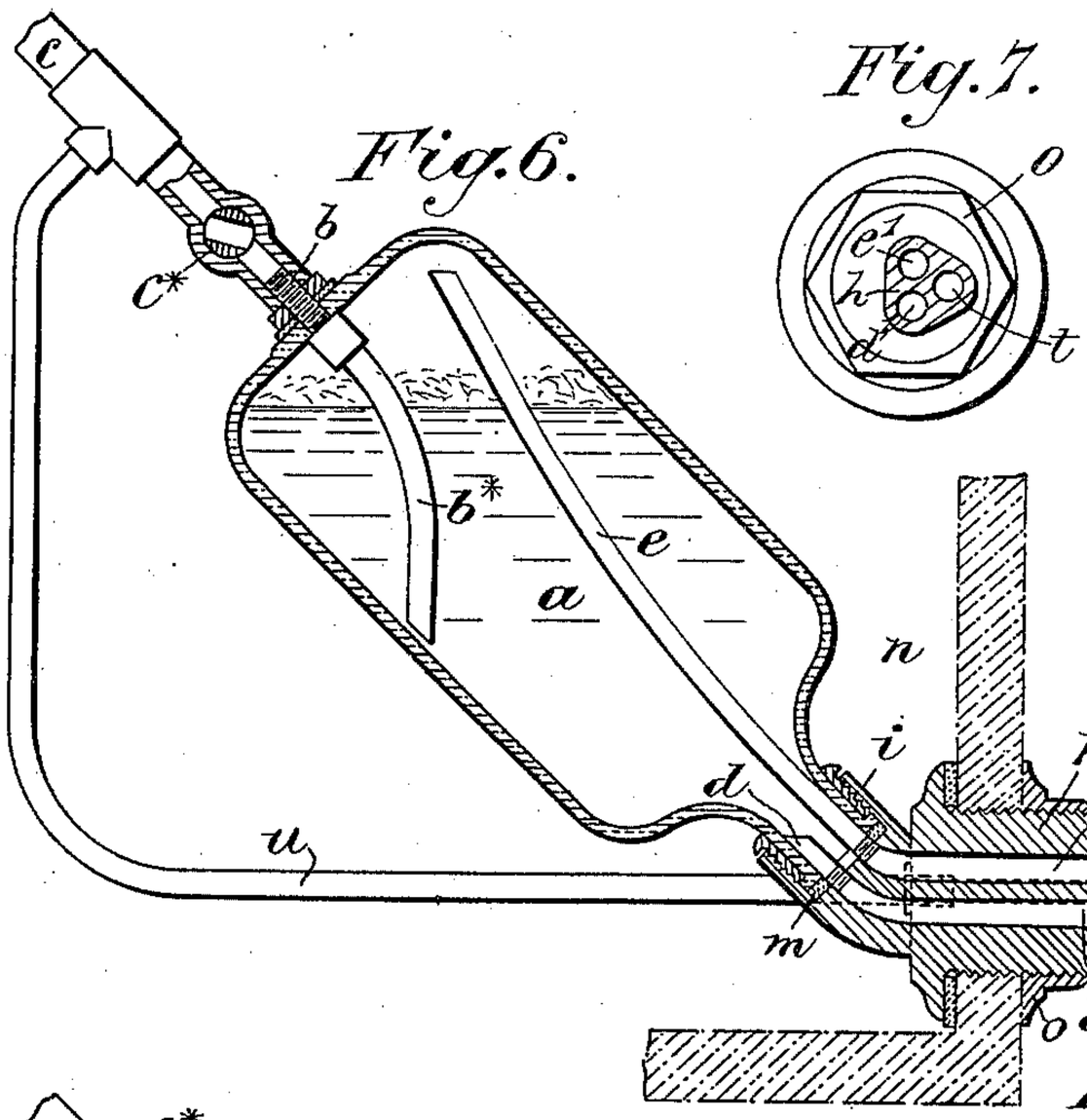

Fig. 7.

Fig. 8.

Fig. 9.

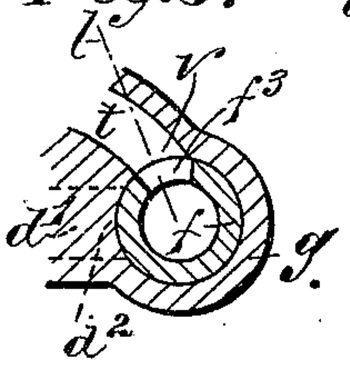

Fig. 10.

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UNITED STATES PATENT OFFICE.

ALFRED BRAKE, OF CLAPHAM, (LONDON,) ENGLAND.

APPARATUS FOR DRAWING OFF LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 688,586, dated December 10, 1901.

Application filed August 26, 1901. Serial No. 73,250. (No model.)

To all whom it may concern:

Be it known that I, ALFRED BRAKE, a subject of the King of Great Britain and Ireland, residing at Clapham, London, England, have invented Improvements in Apparatus for Drawing Off Liquids, of which the following is a specification.

This invention consists of improvements in that kind of apparatus for drawing off liquids in which a vessel, commonly called the "intermediate" vessel, is normally in communication with the liquid-storing vessel, so that it will stand charged with liquid ready to be drawn off; and it has special reference to apparatus for drawing off lager-beer and other like liquids highly charged with gas under pressure and hereinafter referred to as "beer," wherein the intermediate vessel, which serves as a frothing and settling chamber, is normally in open communication with the liquid-supply pipe-or vessel, is provided with a normally closed liquid-discharge pipe or passage leading from its lower end, and is adapted to have its upper part, which is normally disconnected from the external atmosphere, placed in communication with such atmosphere, when required, so as to allow of gas under pressure therein being released, when desired, without closing the liquid-inlet or opening the liquid-outlet. Apparatus of this kind is described in the specification of my United States Patent No. 673,532.

My present invention has for its object to enable lager-beer and other frothy liquids (hereinafter referred to as "beer") charged with gas under pressure to be drawn off either with very little froth or with a creamy head of froth of any desired depth.

The invention consists, for this purpose, in an improved construction of draw-off apparatus wherein the liquid-inlet of the intermediate vessel or frothing chamber is in constant communication with the liquid-supply pipe or vessel and is made of smaller cross-sectional area than the liquid-outlet of the said intermediate vessel, and the means for controlling the gas-outlet from the top of the said intermediate vessel or frothing chamber are so arranged as to place the top of the intermediate vessel only in temporary communication with the external atmosphere when operating the apparatus for the purpose of drawing off its contents or a portion thereof, so that upon operating the apparatus for the purpose just mentioned the gas-outlet will be first opened to release the gas-pressure and then closed, and the beer-outlet will be opened and beer allowed to run out of the intermediate vessel faster than fresh beer will run into it, and without any admission of air to such vessel, with the result that beer can be drawn off in advantageous manner and with very little froth.

The invention also consists in providing in connection with the said intermediate vessel means whereby any desired quantity of frothy beer can be drawn off into a glass or other receptacle, either after or before the main quantity of beer has been drawn off, with very little froth, so as to produce the desired creamy head of froth.

The invention also consists in various other novel features of construction and in certain combinations and arrangements of parts, all as hereinafter more fully described, and specifically pointed out in the claims.

In the accompanying illustrative drawings, Figure 1 shows in vertical section one construction of draw-off apparatus constructed according to this invention, and whereby beer can be drawn off with very little froth. Figs. 2, 3, 4, and 5 are sections on the line A A of Fig. 1, showing the plug of a cock forming part of that apparatus in four different positions. Fig. 6 is a vertical section showing drawing-off apparatus like that illustrated in Fig. 1, but adapted to admit of a small quantity of frothy beer being drawn off direct from the beer-supply pipe. Fig. 7 is a cross-section on the line B B of Fig. 6. Figs. 8 and 9 are cross-sections on the line C C of Fig. 6, showing the plug of the draw-off cock in two different positions. Fig. 10 is a similar view to Figs. 1 and 6, showing a modified construction for enabling a small quantity of frothy beer to be drawn off.

In the arrangement shown in Figs. 1 to 5, inclusive, the intermediate vessel *a*, which may be of pewter, glass, or other suitable material, is connected at its inlet end—as, for example, by a screwed pipe *b*—to the delivery end *c* of the beer-supply pipe extending from a beer-barrel located at a lower level, the said delivery end *c*, which forms the liq-

uid-inlet of the vessel, being provided with a cock c^*, whereby the cross-sectional area of the said liquid-inlet can be made suitably smaller than the liquid-outlet. The relative cross-sectional areas of the liquid inlet and outlet will depend upon the pressure with which the beer is supplied to the vessel and can by means of the cock c^* be readily varied to suit requirement. The pipe b is provided with a downward extension b^*, that extends below the normal level of the liquid in the vessel and terminates near to the inner surface thereof. At its lower end the said vessel a is provided with a beer-outlet pipe d and also with a gas-outlet pipe e, the top of which terminates within and near to the top of the said vessel, and the lower end of which terminates in a passage e', arranged near to a beer-outlet passage d', communicating with the pipe d. The beer and gas outlet passages d' and e' are controlled by a cock or faucet comprising a plug f and a case g, which in the example forms part of a tubular device h, in which the said beer and gas passages d' and e' are formed and which is provided with a socket i, in which the lower end of the intermediate vessel a is secured in a fluid-tight manner by a divided screw-ring k and a packing-ring m. The pipes d and e are secured in the bottom of the socket i, so as to be in communication with the passages d' and e', respectively. The passages d' and e' terminate in ports d^2 and e^2 within the case g, and the plug f is formed with ports f' and f^2. These ports d^2, e^2, f', and f^2 are so relatively arranged, as shown, that normally (see Figs. 1 and 2) the beer and gas outlet passages d' and e' are both closed and that upon turning the plug f in the direction of the arrow 1 by the handle l the gas-outlet passage e' will be first opened through the port f', Fig. 3, and then closed, Fig. 4, after which the beer-outlet passage d' will be opened through the port f^2, Fig. 5, and upon turning the plug in the opposite direction back into its original position the beer-outlet passage d' will be first closed and then the gas-outlet passage e' will be again momentarily opened and closed. The intermediate vessel a may, as shown, conveniently resemble a bottle in shape and be held in an inverted and inclined position within a box n, adapted to contain ice, the neck of the bottle-shaped vessel being carried by the tubular device h, which extends through a hole in the lower portion of the said box, in which it is secured by a screw-ring o or other suitable means and a packing-ring o'.

By the construction described the intermediate vessel a will normally stand nearly filled with beer charged with carbon dioxid under pressure, and above it, within the upper part of the vessel, will be carbon-dioxid gas under pressure. Upon placing the top of the vessel in momentary communication with the external atmosphere, as hereinbefore described, the excess of gas-pressure will be removed, and upon the liquid-outlet being afterward opened while the gas-exit opening is closed the beer will be discharged by gravity, aided by the gas-pressure still existing in the vessel and the inflowing beer, the beer flowing out into a receptacle in a smooth steady stream with the production of very little froth. During the drawing off a fresh quantity of beer will enter the vessel, but at a slower rate than the issuing beer on account of the cross-sectional area of the inlet being less than that of the outlet, this inflow continuing after the liquid-outlet has been closed and until the level of the liquid rises to the normal height and the gas-pressure in the vessel balances the pressure under which the beer is supplied. To obtain the best results, a short interval should elapse between successive drawing-off operations to allow time for froth produced in the vessel during the inflow of a fresh quantity of beer to settle. For this purpose, where it is desired to draw off lager or like beer frequently, it is convenient to use several vessels, arranged side by side, and to draw off beer from each of them in succession.

In some cases, instead of drawing off beer of the kind referred to into tumblers or other receptacles, so that there shall be very little froth on the surface of the drawn-off beer, as hereinbefore described, it is desired that the surface of the beer shall be covered with a creamy head of froth of, say, about twelve millimeters in depth. To enable this result to be attained, the drawing-off apparatus is constructed in such a way that after any desired quantity of the beer has been drawn off with very little froth from the intermediate vessel the beer-outlet can be placed in direct communication with the beer-supply pipe or vessel or with the intermediate vessel without releasing the gas-pressure from such vessel, so that the necessary small quantity of frothy beer can be drawn off to produce the desired effect. Usually the movable handle or equivalent (hereinafter called the "handle") employed for effecting the drawing off of beer from the intermediate vessel will be employed for opening the outlet for frothy beer. For this purpose the handle may be so arranged that when moved in one direction it will effect the release of gas under pressure from the top of the intermediate vessel which is in communication with the beer-supply pipe or vessel, as before, and will effect the opening of the beer-outlet from the said vessel, and upon being moved into another position it will open the passage for the supply of frothy beer.

As will be obvious, draw-off apparatus of the kind herein referred to can be constructed in various forms to give the above-mentioned result. In the arrangement shown for this purpose in Figs. 6 to 9, inclusive, the intermediate vessel a is carried by a tubular device h, formed, as before, with beer and gas

outlet passages d' and e', that are respectively in communication with the beer and gas pipes d and e and are controlled by the plug f of a cock or faucet constructed and operating as hereinbefore described with reference to the arrangement shown in Fig. 1. The tubular device h is, however, formed with a third passage t, that is connected by a suitable by-pass pipe u direct to the liquid-supply pipe c and terminates in a port v in the valve-case g, and the plug f is formed with a third port f^3, so arranged in relation to the other two ports f' and f^2 that when the plug is turned backward by its handle l beyond its normal position (shown in Fig. 8) and into the position shown in Fig. 9 it will open the third port v and the secondary pipe t and allow frothy beer to be drawn off, for the purpose set forth. l' is a spring by which the handle l will when released be automatically returned to its normal position, Fig. 8, in which each of the ports d^2, e^2, and v is closed.

As the beer standing in the intermediate vessel would issue therefrom in a frothy condition if the excess of gas-pressure in the top of the vessel were not released previous to the drawing off, it will be obvious that a small portion of such frothy beer may be drawn off for producing the desired amount of head on the drawn-off beer having very little head. For this purpose the plug f may, as shown in Fig. 10, be formed, in addition to the ports f' and f^2, with a third port f^3, so arranged that after beer has been drawn off with little or no head and the plug has been returned to its normal position and the vessel a allowed to become recharged with a fresh quantity of frothy beer, as hereinbefore described, a small quantity of such beer can be drawn off by turning the plug backward to a small extent beyond its normal position, so as to again open the liquid-outlet d', but this time through the port f^3 and without releasing the excess of gas-pressure from the top of the vessel, so that frothy beer will then be drawn off. With the arrangements shown in Figs. 6 to 10, inclusive, the desired quantity of frothy beer can, if desired, be first drawn off by moving the handle backward and then the desired quantity of beer with very little froth can be drawn off by moving the handle forward. Also with the arrangements shown in Figs. 6 to 10, inclusive, the cock can be used for opening the intermediate vessel a for drawing off beer without opening the gas-exit port e^2 at all when for any reason the pressure of the gas in the said vessel falls so low that it need not be reduced before opening the beer-exit port d^2.

It will be evident that various changes could be made in the details of construction of my apparatus without departing from the spirit and scope of the invention so long as the relative arrangements of parts shown in the drawings or the mode of operation described in the specification is preserved.

What I claim is—

1. In apparatus for drawing off liquid subject to gaseous pressure, the combination of a pressure-reducing chamber having a separate liquid-inlet, and adjacent liquid-outlet and gas-exit passages, and a single draw-off device that normally closes said passages and is capable when operated, of first opening and then closing the gas-exit passage, of afterward opening the liquid-outlet passage, and when moved into another position, of closing said liquid-outlet passage, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

2. In apparatus for drawing off liquid subject to gaseous pressure, the combination of a pressure-reducing chamber having a separate liquid-inlet, and adjacent liquid-outlet and gas-exit passages, said liquid-inlet being of smaller cross-sectional area than said liquid-outlet, and a single draw-off device that normally closes said passages and is capable, when operated, of first opening and then closing the gas-exit passage, of afterward opening the liquid-outlet passage, and when moved into another position, of closing said liquid-outlet passage, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

3. In apparatus for drawing off liquid subject to gaseous pressure, the combination of a pressure-reducing chamber having a separate liquid-inlet, and adjacent liquid-outlet and gas-exit passages, means for adjusting the cross-sectional area of said liquid-inlet, and a single draw-off device that normally closes said passages and is capable, when operated, of first opening and then closing the gas-exit passage, of afterward opening the liquid-outlet passage, and when moved into another position, of closing said liquid-outlet passage, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

4. In apparatus for drawing off liquid subject to gaseous pressure, the combination of an intermediate or frothing chamber provided at the top with a separate liquid-inlet pipe having a regulating-cock and at the bottom with adjacent beer and gas exit passages, and a single draw-off device whereby said gas-exit passage can be first opened and closed and then said beer-outlet passage can be opened and closed, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

5. Apparatus for drawing off lager-beer and other frothy liquid, comprising an intermediate or frothing vessel having a separate liquid-inlet passage, a separate liquid-outlet passage of larger cross-sectional area than said liquid-inlet passage, and a separate gas-exit passage leading from the upper part of said vessel, a valve-case having beer and gas exit ports in communication with said liquid-outlet and gas-exit passages respectively, and a

single valve adapted when moved in one direction to first open and then close said gas-exit passage and to afterward open said liquid-outlet passage and when moved into another position to close said liquid-outlet passage, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

6. Apparatus for drawing off lager-beer and other frothy liquid, comprising an intermediate or frothing vessel having a separate liquid-inlet passage at the top, a liquid-outlet passage at the bottom, and a gas-exit passage extending through the bottom of said vessel and terminating within and near to the top thereof, means for controlling said liquid-inlet passage, and a single draw-off cock comprising a stationary casing formed with beer and gas exit ports in communication with the beer and gas exit passages respectively, and a hollow rotary plug having ports whereby said beer and gas ports can be separately opened and closed, said liquid-inlet remaining open continuously during the act of drawing off the liquid, for the purposes set forth.

7. Apparatus for drawing off lager-beer and other frothy liquid, comprising an intermediate or frothing vessel having a separate liquid-inlet passage at the top, a separate liquid-outlet passage at the bottom, and a separate gas-exit passage extending through the bottom of said vessel and terminating within and near to the top thereof, means for controlling said liquid-inlet passage, and a single draw-off cock comprising a stationary casing formed with beer and gas exit ports in communication with the beer and gas exit passages respectively, and a single hollow rotary plug having ports arranged so that when said plug is rotated in one direction from its normal position, the gas-exit port will be first opened and closed and then said beer-exit port will be opened, and when moved in the opposite direction from its normal position, said beer-exit port will be first opened, substantially as described for the purpose specified.

8. Apparatus for drawing off lager-beer and other frothy liquids comprising an intermediate or frothing vessel having a continuously open liquid-inlet pipe at the top provided with a cock, and a separate liquid-outlet pipe and a separate gas-exit pipe at the bottom, said gas-exit pipe terminating at its upper end within and near to the top of said vessel, and a tubular holder secured at one end to the lower end of said vessel and provided at the other end with a draw-off cock the casing of which is integral with said holder and is fitted with a hollow rotary plug, said holder being formed with beer and gas passages in communication at one end with said beer and gas pipes respectively and terminating at the other end in beer and gas exit ports d^2 and e^2 within said casing, and said plug being formed with ports f' and f^2 arranged to respectively come opposite said gas and beer ports e^2 and d^2 at separate times, substantially as described for the purpose specified.

9. Apparatus for drawing off lager-beer and other frothy liquids, comprising an intermediate or frothing vessel having an independent liquid-inlet pipe at the top provided with a cock, and an independent liquid-outlet pipe and an independent gas-exit pipe at the bottom, said gas-exit pipe terminating at its upper end within and near to the top of said vessel, and a tubular holder secured at one end to the lower end of said vessel and provided at the other end with a draw-off cock the casing of which is integral with said holder and is fitted with a hollow rotary plug, said holder being formed with beer and gas passages in communication at one end with said beer and gas pipes respectively and terminating at the other end in beer and gas exit ports d^2 and e^2 within said casing, and said plug being formed with ports f', f^2 and f^3 so arranged that when the plug is turned in one direction from the normal, the ports f' and f^2 will separately open and close said ports e^2 and d^2, and when the plug is turned in the opposite direction from the normal said port f^3 will open the beer-exit passage, substantially as herein described for the purpose specified.

10. Apparatus for drawing off lager-beer and other frothy liquids, comprising an intermediate or frothing vessel having a continuously open separate liquid-inlet pipe at the top provided with a cock, and a separate liquid-outlet pipe and a separate gas-exit pipe at the bottom, said gas-exit pipe terminating at its upper end within and near to the top of said vessel, a tubular holder secured at one end to the lower end of said vessel and provided at the other end with a draw-off cock the casing of which is integral with said holder and is fitted with a hollow rotary plug, said holder being formed with beer and gas passages in communication at one end with said beer and gas pipes respectively and terminating at the other end in beer and gas exit ports d^2 and e^2 within said casing, and said plug being formed with ports f' and f^2, arranged to respectively come opposite said gas and beer ports e^2 and d^2 at separate times, and an ice-receptacle within which said vessel is located and through one side of which said tubular holder extends, substantially as described for the purpose specified.

11. Apparatus for drawing off lager-beer and other frothy liquids, comprising the intermediate vessel a having the continuously open beer-inlet pipe c with cock c^*, the beer-outlet pipe d, and the gas-exit pipe e, the tubular holder h fixed at one end to the bottom of said vessel and formed with the beer and gas exit passages d' and e' respectively in communication at one end with said beer and gas pipes d and e and terminating at the other end in ports d^2 and e^2 located within an extension or casing g, and a hollow rotary plug f formed with the ports f' and f^2, the

whole arranged and operating substantially as described and shown for the purpose specified.

12. Apparatus for drawing off lager-beer and other frothy liquids, comprising the intermediate vessel a having the beer-inlet pipe c with cock c^*, the beer-outlet pipe d, and the gas-exit pipe e, the tubular holder h fixed at one end to the bottom of said vessel and formed with the beer and gas exit passages d' and e' respectively in communication at one end with said beer and gas pipes d and e and terminating at the other end in ports d^2 and e^2 located within an extension or casing g, and a hollow rotary plug f formed with the port f' arranged to come opposite the port e^2 when the plug is turned in one direction, and with ports f^2 and f^3 arranged to alternately come opposite the port d^2 when said plug is turned alternately in opposite directions, substantially as described for the purpose specified.

Signed at 77 Cornhill, in the city of London, this 14th day of August, 1901.

ALFRED BRAKE.

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