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A. KLEINFELDT.

BEER SIPHON.

(Application filed Aug. 19, 1899.)

(No Model.)

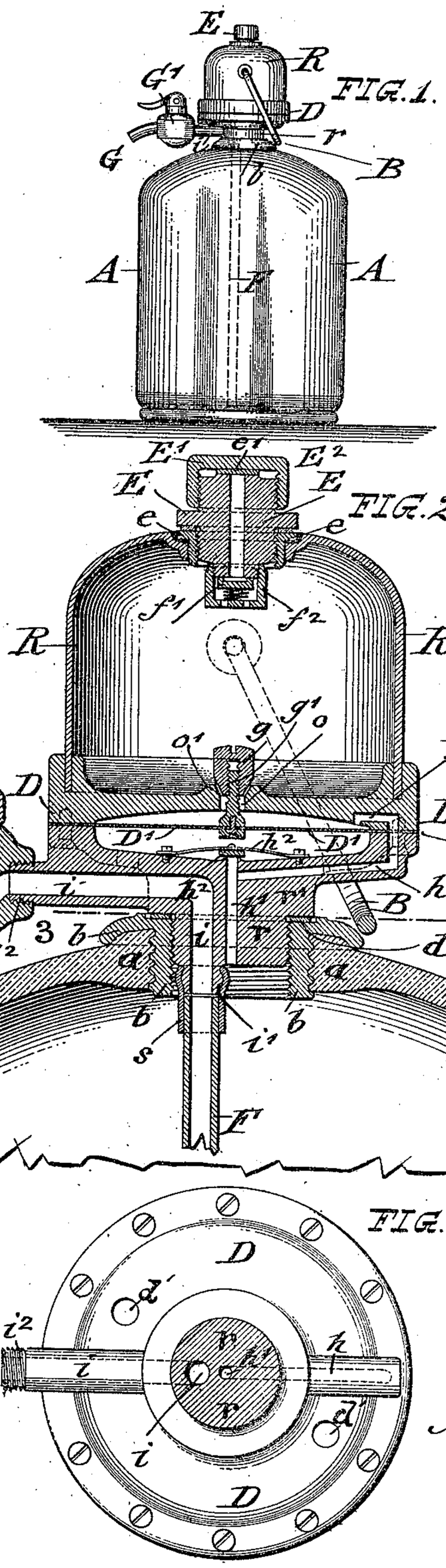

FIG. 1.

FIG. 2.

FIG. 3.

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BEER-SIPHON.

SPECIFICATION forming part of Letters Patent No. 653,516, dated July 10, 1900.

Application filed August 19, 1899. Serial No. 727,754. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KLEINFELDT, a citizen of the United States, residing in New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Beer-Siphons, of which the following is a specification.

This invention relates to certain improvements in beer siphons or vessels of that class in which are contained fermented liquids under a pressure of carbonic-acid gas and from which the liquid can be drawn through a valved spout under pressure of the gas until the vessel is entirely emptied. A number of devices have heretofore been proposed for this purpose, but so far with little practical success, partly for the reason that the vessels were too cumbrous and little adapted for convenient refrigeration and partly for the reason that the mechanism by which the carbonic-acid gas was supplied from its receiver to the liquid-containing vessel did not function with a sufficient degree of reliability when in use.

The object of this invention is to supply a siphon for dispensing fermented liquids under pressure of carbonic-acid gas which has a compact shape, so that it can be conveniently cooled in an ice-box or in a special cooler, and in which the carbonic-acid-supplying mechanism is constructed in a reliable and effective manner, so that a sufficient quantity of carbonic-acid gas is supplied for forcing out all the liquid contained in the vessel under uniform pressure; and the invention consists of a beer-siphon which comprises a liquid-containing vessel, a receiver for the carbonic acid secured to the neck of the vessel, said receiver being provided with a valved plug for charging the carbonic-acid gas into the same, an opening in the bottom of said receiver, a valve for opening and closing said opening, a diaphragm connected with the stem of said valve, a channel connecting the space on the pressure side of the diaphragm with a bore in the neck of the receiver and with the interior of the liquid-containing vessel, openings for connecting the space at the opposite side of the diaphragm with the atmosphere, and a valved siphon-tube for drawing off the liquid under pressure from the liquid-containing vessel.

The invention consists, further, of certain details of construction, which will be fully described hereinafter, and finally pointed out in the claim.

In the accompanying drawings, Figure 1 represents a side elevation of my improved beer-siphon. Fig. 2 is a vertical central section through the head of the siphon, drawn on a larger scale; and Fig. 3 is a bottom view, partly in horizontal section, on line 3 3, Fig. 2, of the carbonic-acid receiver.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents a vessel which is preferably made of glass in the general shape of an ordinary siphon for carbonated waters, said siphon being made of sufficient size to contain one, two, or more gallons of fermented liquid, such as beer, ale, wine, &c. The liquid vessel A can also be made of steel or other suitable material, though it is preferable to make it of glass, so that the contents of the vessel can be readily seen. The vessel A is provided with a neck *a*, having an interior thread into which is tightly screwed and cemented a bushing *b*, into which the threaded neck *r* of a carbonic-acid receiver R is screwed. A ring-shaped gasket *d*, of elastic material, is interposed between the shoulder *r'* of the neck of the receiver R and the recessed top part of the bushing *b*, so as to secure the tight fitting of the receiver to the neck of the liquid vessel.

The carbonic-acid receiver R is preferably made of copper or other suitable material, its upper part being dome-shaped, while its lower edge is securely soldered or brazed into the upper half of a diaphragm-casing D, the lower half of which is secured by screws *b* to the upper half, said two halves holding the sheet-metal diaphragm D' tightly in position between their circumferential rims. The neck *r* of the receiver R is cast integral with the lower half of the diaphragm-casting D, said lower half being provided with a number of openings *d'*, so that atmospheric pressure is exerted on the under side of the diaphragm D'.

The receiver R is provided at its central top part with an opening having an interiorly-threaded bushing *e*, into which is screwed a plug E, which has a central perforation *f*, the inner end of which is closed by a spring-actuated valve *f'*, retained by a perforated cage f^2. The valved plug E serves for charging the receiver R with carbonic-acid gas under pressure. The carbonic acid is preferably supplied to the receiver by connecting the upper threaded end of the plug E with a tube connecting it with the outlet-valve of a cylinder containing liquid carbonic acid. As soon as the required degree of pressure is established in the receiver, which is determined by a suitable pressure-gage on the supply-pipe, the supply of carbonic-acid gas is interrupted by disconnecting the carbonic-acid cylinder from the receiver, the internal pressure in the receiver closing the valve *f'* of the plug E. A cap E' is then screwed on the upper end of the plug E, a packing-disk *e'* being interposed between the cap and the upper end of the plug, so that the tight closing of the receiver R is produced. The bottom of the receiver R is provided with an opening *o*, having a beveled valve-seat *o'*, on which fits tightly a correspondingly-shaped valve *g*. The stem *g'* of the valve *g* passes through the opening *o* and is connected with the center of the diaphragm D'. The valve *g* is provided with an interiorly-threaded socket, so that it can be adjusted higher or lower on the threaded upper end of the valve-stem. The valve *g* has a nick g^2 in its head, so that a screw-driver can be inserted through the opening in the top of the receiver R after the plug E has been removed, and thereby the position of the valve *g* on its stem adjusted higher or lower relatively to its valve-seat. A channel *h* in the upper half of the diaphragm-casing D leads from the space above the diaphragm into the lower half of the casing D and then in an inclined direction in the same to a center bore *h'* in the neck *r*, as shown in Fig. 2, so as to place the space above the diaphragm in communication with the interior of the liquid-containing vessel. The upper end of the bore *h'* is closed by a spring-actuated escape-valve h^2, so that in case the pressure in the liquid-containing vessel should rise above the required pressure the escape-valve will be lifted against the tension of its spring and the surplus gas discharged into the space below the diaphragm and from the same into the atmosphere. As soon as the normal pressure for which the escape-valve is set is established in the liquid vessel the escape-valve will close again the central bore of the neck *r*. The lower half of the valve-casing D is further provided with an outlet-channel *i* of larger size than the channels *h h'*, said outlet-channel being provided at its inner end with a nipple *i*, to which a siphon-tube F is applied by means of an elastic sleeve *s*, said sleeve permitting a certain play to the siphon-tube, so that during transportation or by rough handling or shocks the siphon-tube can "give" sufficiently so as to be prevented from breaking. The outlet-channel *i* is provided with an exteriorly-threaded nipple i^2 at its outer end, to which a discharge-spout G, having a valve, faucet, or other suitable device G', is applied. This discharge spout or nozzle G is screwed onto the nipple of the outlet-channel, which nipple is preferably cast integral with the lower half of the diaphragm-casing D. Any suitable construction of valve or stop-cock for the discharge-spout may be used, that shown in the drawings being in the nature of an ordinary lever-actuated valve, such as commonly used on siphons for aerated waters.

The receiver R is provided at diametrically-opposite points of its side wall with sockets for receiving the inwardly-bent ends of a pivoted bail B, by which the siphon can be conveniently carried. When the bail is not in use, it assumes an inclined position of rest, as shown in Fig. 1.

The operation of my improved beer-siphon is as follows: The fermented liquid is charged into the liquid vessel A under pressure of carbonic-acid gas through the discharge-spout in the same manner as the siphons for aerated waters are charged, or the liquid is charged without pressure into the liquid vessel by unscrewing the neck of the receiver from the bushing in the top part of the vessel and then supplying the vessel with the determined quantity of fermented liquid. The receiver is then screwed again into position in the bushing of the vessel. The plug E is then removed and then connection with a cylinder containing liquid carbonic acid established. As soon as the required pressure of carbonic acid in the receiver is obtained, which is read off on a suitable pressure-gage connected with the supply-pipe leading from the cylinder to the receiver, the cap is placed on the plug E and the receiver thereby tightly closed. During the charging of the receiver with carbonic-acid gas the diaphragm is in its normal position with the valve *g* in open position—*i. e.*, away from its seat—so that the gas can pass through the opening or port *o* into the space above the diaphragm and through the channel *h h'* into the space above the liquid in the vessel A. As soon as the required pressure is established in the receiver R and the liquid-containing vessel A the back pressure of the gas from the liquid vessel will act upon the diaphragm D', so that it will bulge downward and close the valve *g* tightly on its seat *o'*, so as to interrupt the connection of the liquid vessel with the receiver. The parts remain in this condition until liquid is to be drawn from the vessel A by opening the valve of the discharge-spout. As soon as the discharge-spout is opened, the liquid will flow through the siphon-tube and the spout into the receptacle held below the same. The gas-pressure in the liquid vessel A above the liquid is reduced during the discharge of the

liquid, and thereby the pressure on the diaphragm reduced, so that it will return into its normal position and lift the valve *g*, whereby a new supply of gas can pass from the receiver to the liquid vessel. As soon as the valve of the discharge-spout is closed and the outflow of liquid interrupted, the back pressure of the gas in the liquid vessel will again act on the upper surface of the diaphragm and press the same downward into slightly-bulged shape, so as to cause the valve to be seated firmly on its seat and interrupt thereby the connection of the receiver with the liquid vessel and the supply of gas to the latter. To secure the required pressure in the liquid vessel, the valve is adjusted on its valve-stem either in upward or downward direction. When the valve is adjusted higher on its stem, a greater pressure is necessary to close the valve than when the valve is adjusted lower on its stem, in which case a smaller pressure is required.

My improved beer-siphon has the advantages of compact shape, so as to be easily cooled either in the refrigerator or cooler. All the parts by which the carbonic acid is supplied to the liquid vessel are fully inclosed and not liable to be rendered inoperative. The siphon can be manufactured at comparatively-small expense and enables the consumer to be supplied with fermented liquids in larger quantities, such as one or two or more gallons, in place of delivering them in bottles in the usual manner. As the liquid drawn from the siphon is always under pressure of carbonic-acid gas it is more refreshing and palatable and can be drawn off at different times and in any desired quantity, the siphon being then returned to the refrigerator, so that its contents are kept cool and ready for use whenever required.

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

The combination, with a liquid vessel, of a carbonic-acid receiver provided with a neck secured into said liquid vessel, said neck having a longitudinal bore, a diaphragm-casing at the lower part of said receiver provided with an opening communicating with the atmosphere, a diaphragm supported by said casing, a valve located in the receiver, a stem connecting said valve through the opening or port in the bottom of the receiver with the diaphragm, a gas-supply channel connecting the space above the diaphragm with the liquid vessel, a spring-actuated escape-valve at the upper end of said bore, an outlet-channel located in the lower part of the diaphragm-casing, a siphon-tube connected with the inner end of said outlet-channel, and a valved discharge-spout connected with the outer end of said outlet-channel, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ARTHUR KLEINFELDT.

Witnesses:
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