M. HEY.

Apparatus for Cooling and Preserving Beer and other Liquids.

No. 146,904. Patented Jan. 27, 1874.

Fig. 1.

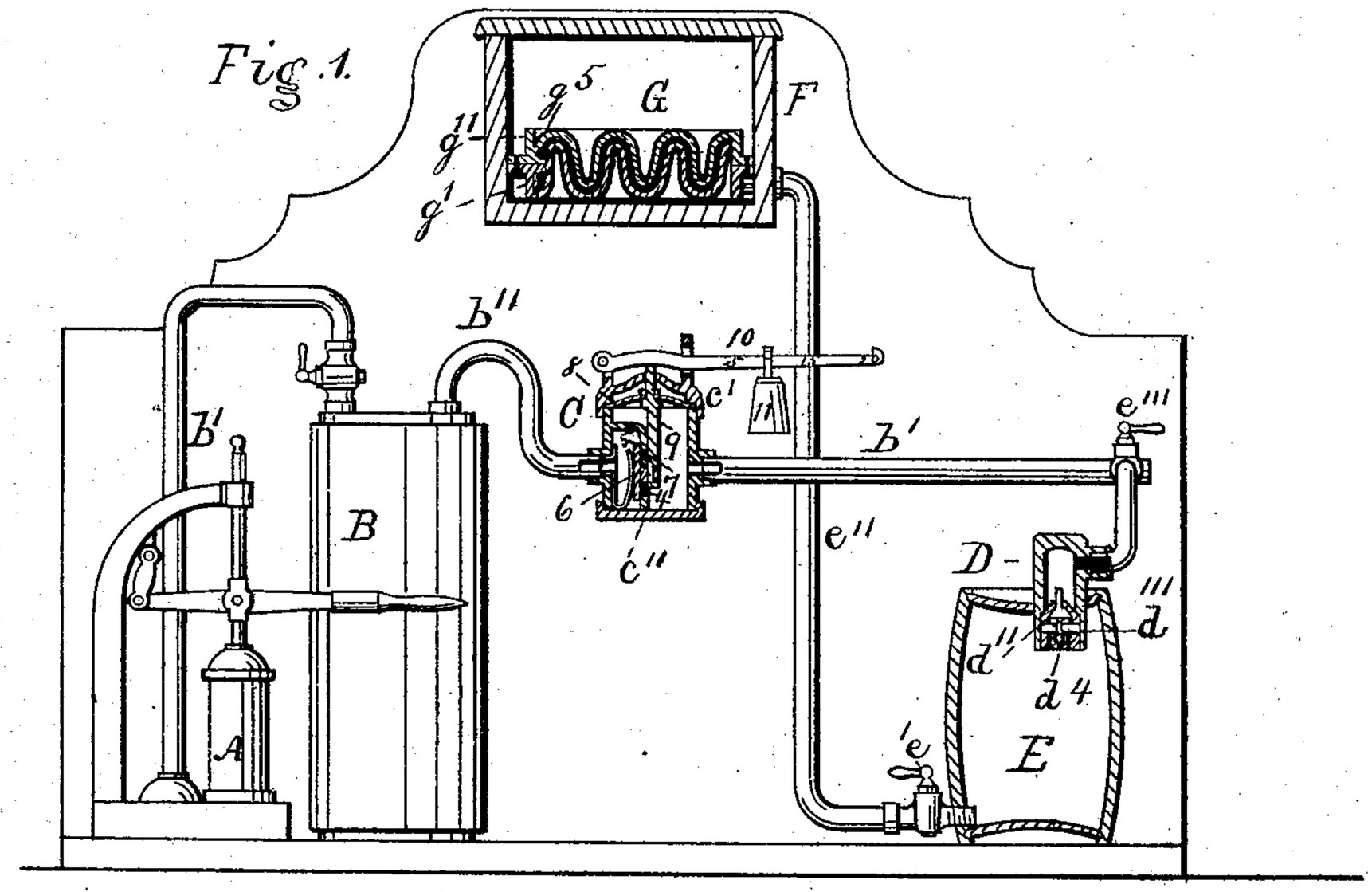


Fig. 2.

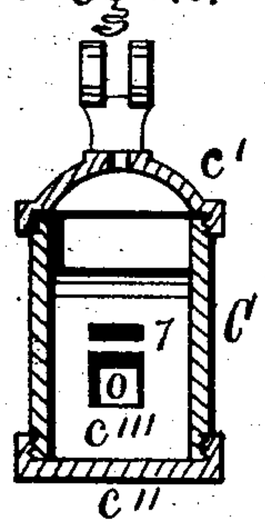


Fig. 3.

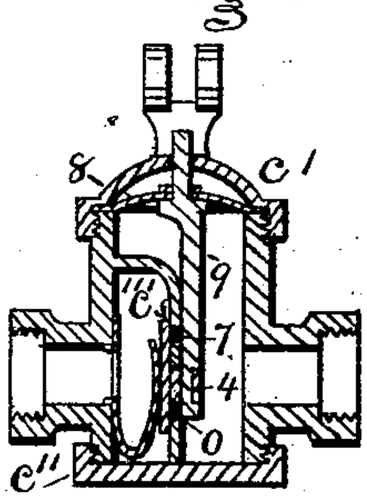


Fig. 4.

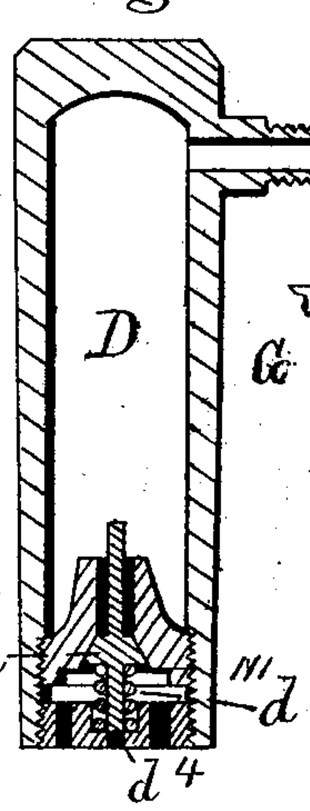


Fig. 5.

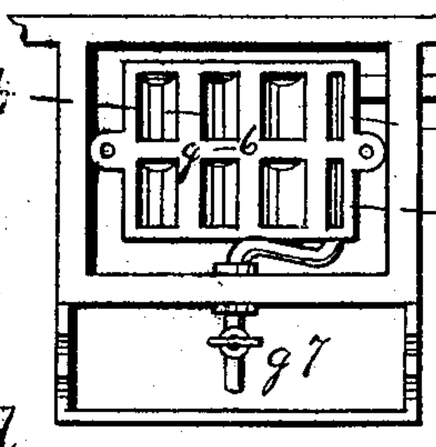


Fig. 8.

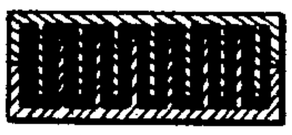


Fig. 6.

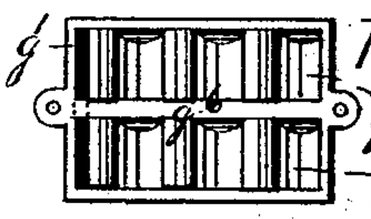
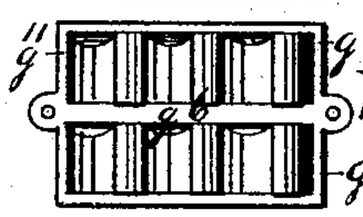


Fig. 7.



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IMPROVEMENT IN APPARATUS FOR COOLING AND PRESERVING BEER AND OTHER LIQUIDS.

Specification forming part of Letters Patent No. **146,904**, dated January 27, 1874; application filed December 29, 1873.

To all whom it may concern:

Be it known that I, MICHAEL HEY, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Apparatus for Cooling Beer and other Liquids on Draft, of which the following is a specification:

The object of my invention is to rapidly cool a current of beer or other liquids as it is drawn from a cask or reservoir by causing the current to rise and flow from the cask or reservoir from the pressure of air produced upon the liquid in the reservoir (by means of a hand air-pump or other compressing means) through an air-receiver in communication with the cask or reservoir by a pipe having an automatically-acting check-valve, and a valved bung connected therewith, and constructed substantially as will hereinafter be fully described and set forth, the liquid in the cask or reservoir, under pressure of the air, passing upward therefrom through a common stop-cock and conduit to and through a cooler, (in an ice-box,) constructed substantially as will hereinafter be fully described and set forth, from which the liquid can be run out in a thoroughly-cooled condition.

Figure 1 is a front elevation of my said improved apparatus. Fig. 2 is a vertical section of case or body of the check-valve. Fig. 3 is a vertical section of the check-valve and case at right angles to the section shown in Fig. 2. Fig. 4 is a vertical section of the valved bung; Figs. 2 3 4 being enlarged representations of the check-valve and the valved bung shown in Fig. 1. Fig. 5 is a plan view of the ice-box and its contained cooler of the current of liquid which is to pass through the same, together with the draft-cock for said fluid. Fig. 6 is a plan view of the inner or upper side of the lower half of the cooler—a section of the same being also shown in Fig. 1—as applied. Fig. 7 is a plan view of the inner or under side of the upper half of the said cooler; also, shown in Fig. 1.

The arrangement of the different parts of the apparatus in their relation to each other will be understood by reference to Fig. 1, A being the hand air-pump; B, the air-receiver; C, the check-valve; D, the valved bung; D, a beer-cask; and F, the ice-box containing the refrigerator G. The air-pump is of the ordinary construction for forcing air, and communicates with B through a pipe, b'. B is a hollow cylinder of sheet metal strong enough to sustain a pressure of, say, twenty-five or thirty pounds to the square inch, and communicates with C through a pipe, b''. C is a cast-metal case fitted with detachable top c' and bottom c'', and a partly vertical and partly horizontal or inclined partition, c''', which divides the case into two distinct chambers, the smaller one communicating with the pipe B″ and the larger one with the pipe d'. A square hole, o, is made transversely through the partition c''', into which hole the slotted stem 4 of a covering-plate, 5, fits easily, and is kept in close contact with the vertical part of partition c''' by the pressure of a spring, 6, so as to allow the plate 5 to be moved up and down a short distance, or sufficiently to alternately cover and uncover another small hole, 7, which is made just above the larger hole o. The slotted stem 4 of the covering-plate 5′ is as much less in depth than the hole o, through which it passes, as will limit the vertical motions of the plate 5 in closing and inclosing the smaller hole 7. The up-and-down motions required in the plate 5 are effected, respectively, by increased and diminished pressures of the air in the check-valve C upon the inner or under side of a thin concavo-convex disk, 8, of a springy nature, having permanently fixed in its center a stem, 9, the lower end of which is recessed at opposite sides, so as to slip into the slot in the end of stem 4, and be retained thereby, while the upper end of said stem 9 slides easily in a corresponding hole in the center of the cap c' of the case. Bearing upon the upper end of stem 9 is a lever, 10, having an adjusting-weight, 11, whereby the degree of pressure of the air in the check-valve case C is adjusted at the option of the attendant. The valved bung D is made tapering toward its open end, and in the said open end a conical valve, d'', fits in a corresponding seat. The inner end of the stem of the said valve is triangular in its transverse section, so as to allow the compressed air to pass into the cask E, when the valve is opened by the pressure of said air overcoming the resistance of a spring, d''', and any lesser pressure that may be from air or gas in the vessel E. The said

spring d''' surrounds the outer end of the stem of the valve, and is supported (so as to bear against the shoulder of the conical valve d'') upon a detachable screw-plug, d^4, in the end of the bung D, while the outer end of the stem slides freely in a central hole in the plug d^4, which has several surrounding holes for the passage of the compressed air into the vessel. The object of this valve in the bung is to prevent the fluid in the vessel E from passing up through the pipe d' into the check-valve C. At the lower part of the vessel E there is fitted a common stop-cock, e', through which the compressed fluid in E passes into pipe e'', and thence into the refrigerator G in the ice-box F. (See Fig. 1.) The said refrigerator G consists of two corresponding metallic parts, g' g'', (see Figs. 6 and 7,) each cast with two rows of serpentine partitions, which, when the two parts are bolted together water-tight, two serpentine channels, g^3 g^4, are left side by side, between the two parts g'' g', which communicate through a hole, g^5, in one end of the straight partition g^6, which separates the two rows of serpentine partitions in each part g' g''. The fluid from the vessel E enters through pipe e'' into one end of the serpentine channel g^3 to its opposite end, thence through the hole g^5 into the serpentine channel g^4, and out at its opposite end through an ordinary stop-cock, g^7, which is to be operated by the attendant from time to time, as occasion may require in drawing the fluid. The upper and the lower sides of the refrigerator G have dells or open spaces left by the alternating bends in the serpentine partitions, and consequently the water of the melting ice in the box F, together with the refrigerating effect of the ice upon the refrigerator G, the fluid which is forced through the serpentine channel g^3 g^4, when the cock g^7 is opened, will be proportionately cold.

A modification of the said refrigerator G is shown by Fig. 8, in which a rectangular, instead of the serpentine, channel is produced by straight re-entering transverse partitions; but as this modification has not any outside dells or cavities for the entrance of cooling water from the melting ice, the construction shown in Figs. 1, 5, 6, 7 is necessarily more effective, and therefore will be used in preference.

It will be understood, without further description, that when the beer or other beverage ceases to be raised and discharged (at the opened draft-cock g^7) by the pressure of its own gas, by forcing air into the cylinder B, it will pass through the hole 7 in partition c''' of the check-valve C, and thence into the vessel E, through the valved bung D, until the pressure upon the springy disk 8 causes it to lift the weighted lever 10, and at the same time to close the hole 7, and thus prevent the return of the compressed air, or its passage in either direction through the check-valve, which is the object of this part of my invention.

The degree of pressure can be regulated at will by shifting the weight 11 upon the lever. When the pressure in the vessel E is not sufficient to force the fluid from the vessel through the refrigerator as strongly as may be desired, the pressure of the weighted lever 10 forces the center of the concavo-convex disk 8 downward, and consequently causes the slide to open the hole 7 and admit from the compressed reserve of air in the cylinder B sufficient pressure in the vessel E to restore the flow desired.

The vessel E can be readily detached by stopping communication through the cocks e' e'''.

I claim as my invention—

1. The combination, in an apparatus for cooling and forcing liquids from a beer-cask or other vessel by the pressure of air, substantially as described, of the partition c''', hole 7, and plate 5 with the stem 9 and springy disk 8 of the check-valve C, as and for the purposes hereinbefore set forth.

2. The combination, in an apparatus for cooling, and forcing by the pressure of air, liquids from a beer-cask or other vessel, substantially as described, of a refrigerator, G, constructed of the two corresponding parts g' and g'', adjustably bolted together and forming the advance and return channels g^3 g^4 therein for the passage of the beer, and the exterior dells for the ice-water, as set forth, with the ice-box F, pipes e'' and g^7, arranged to operate together in the manner hereinbefore set forth and described.

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Witnesses:

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