(No Model.)

A. MOLDENHAUER.

HYDRAULIC PUMP FOR LIQUID DISPENSERS.

No. 590,233. Patented Sept. 21, 1897.

Fig. 5.

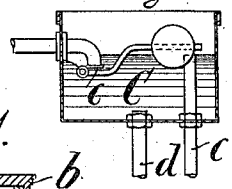


Fig. 1.

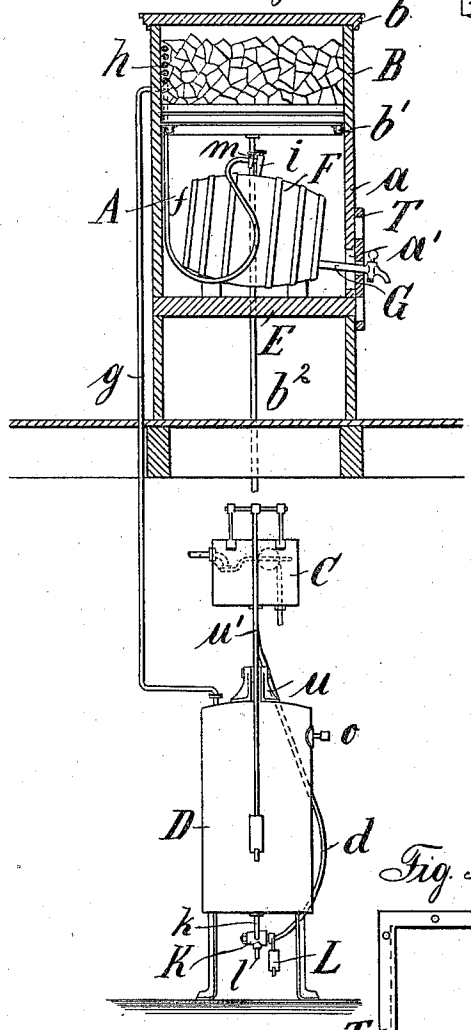


Fig. 2.

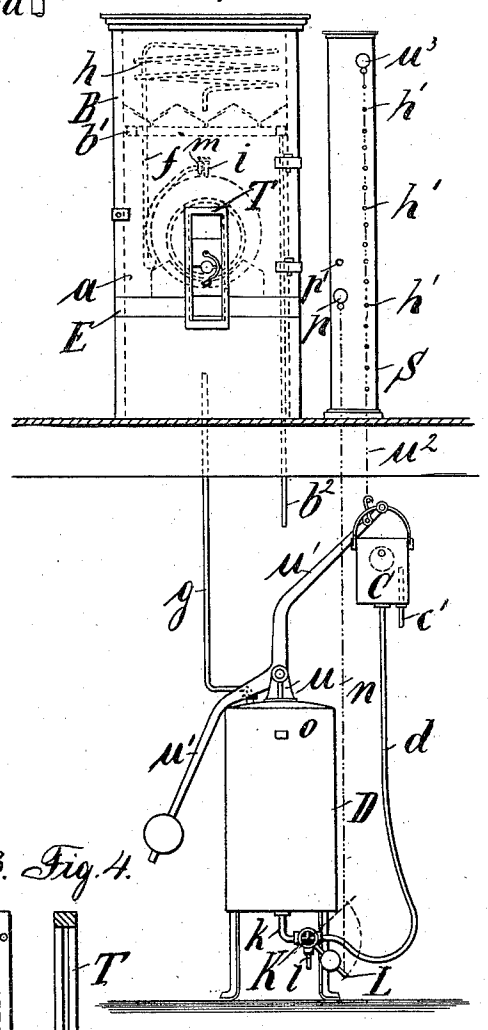


Fig. 3.

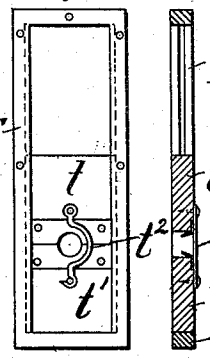


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC PUMP FOR LIQUID-DISPENSERS.

SPECIFICATION forming part of Letters Patent No. 590,233, dated September 21, 1897.

Application filed September 24, 1895. Serial No. 563,470. (No model.) Patented in Germany November 2, 1893, No. 77,995, and November 24, 1894, No. 82,654.

To all whom it may concern:

Be it known that I, ADOLF MOLDENHAUER, a subject of the Emperor of Germany, residing at Munich, Germany, have invented certain new and useful Improvements in Apparatus for Dispensing Liquids, (for which Letters Patent have been obtained in Germany, No. 77,995, dated November 2, 1893, and addition thereto, No. 82,654, dated November 24, 1894;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention has relation to apparatus for dispensing so-called "aerated" or "carbonated" liquids, more especially beer; and it has for its object the provision of means whereby the beer may be drawn directly from the barrel without loss of carbonic-acid gas, whereby air or carbonic-acid gas or a mixture of air and carbonic-acid gas may be supplied to the barrel under pressure as a means for forcing the beer, whereby the air in the room in which the beer is dispensed is excluded from the barrel, and whereby the pressure under which the beer is forced may be regulated, as will now be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional side elevation; Fig. 2, a front elevation of a dispensing apparatus embodying my invention; Fig. 3, a front elevation of the closing slides with their guides; Fig. 4, a vertical section through Fig. 3, and Fig. 5 a sectional elevation of the float-valve and its vessel.

In the drawings I have shown the air-compressing appliances as located in a room below the one in which the beer is dispensed not only with a view to avoid taking up space, which is generally not available, but also with a view to exclude foul air from the compressor; yet where space is available the air-compressing appliances may be located in the room where the beer is dispensed, and the supply of air may then be taken from another room or from without the building.

In said drawings, A indicates a chest in the upper part of which is contained a receptacle B for ice, which is provided with a lid b, and at its bottom with a gutter b', from which a pipe b^2 passes downward for ice-water.

The chest A is provided with a door or doors a for the introduction and removal of the barrel or barrels F, the construction and arrangement being a well-known one. In this arrangement the chest is devoid of a bottom and seats directly on a table, counter or bar, skid, or like support E, any usual or well-known means being provided to form an air-tight joint between the chest A and its support, which latter constitutes the bottom for the chest. The ice-receptacle B contains a cooling-coil h, to the terminals of which are connected the flexible pipe f and the pipe g. The pipe f is connected with a vent-plug adapted to be driven into the bung-hole in the barrel F, a suitable stop-cock m being provided for the purpose of cutting off the connection between the barrel and the coil h. The pipe g is connected with the air-compressor D, presently to be described.

In its door a the chest A has a slot a' of sufficient width to admit of the passage of a spigot G, said slot being normally closed by means of two slides t and t', sliding in suitable grooved guides T, the proximate faces of said slides having a semicylindrical recess forming a bearing for the spigot G.

The upper slide t is preferably provided with a hooked locking-latch t^2, adapted to hook onto a suitable stud on the lower slide t', thus holding the slides close together, said slides forming a substantially air-tight closure of the slot a' in the front wall or door a of the chest and around the spigot G.

I will now describe the air-compressing appliances: These consist, essentially, of a compressing-cylinder, hereinafter called the "compressor" D, to the upper end of which the pipe g, leading to the cooling-coil h, is connected, and means for supplying water to said cylinder and admitting air thereto when found necessary. From the bottom of the compressor D leads a pipe provided with a three-way cock or valve K, with a waste-pipe l and with a water-supply branch k, the arrangement being such that when the valve K is in a given position communication is established be-

tween the compressor and its supply branch *k*, Fig. 2, while by revolving the valve ninety degrees in the proper direction communication is established between said compressor and the waste-pipe *l*. To the valve K is secured a weighted lever L, to which is attached a rod, cord, or chain *n*, that is carried to a standard S in the bar-room, the free end of said rod being provided with a ring or hook adapted to be hooked into one of two pins or hooks *p* and *p'* on said standard S. When the rod is hooked to pin *p*, the valve-plug is in the position shown in Fig. 2. When, on the other hand, the rod is hooked to pin *p'*, communication is established between the compressor and the waste branch *l*.

It is obvious that if water is supplied to the compressor D under sufficient head the air therein will be compressed and can then be admitted to the barrel F by manipulating the cock *m* at the bung-vent, the supply of water to the compressor being automatically interrupted as soon as the pressure therein is equal to the pressure under which the water is supplied, while such pressure may be regulated by varying the supply of water—as, for instance, by means of a suitable valve or stop-cock in the supply branch. Although in such an arrangement the water-supply-regulating valve may be placed within reach of the bartender, yet in view of the fact that the head of water—*i. e.*, the pressure in the supply-main—varies considerably in a day unless great care is exercised, water may enter the beer-barrel. This I absolutely avoid by providing means for supplying water to the cylinder under a normal unvarying pressure or head sufficient for all emergencies, in conjunction with which I provide means within the control of the bartender for regulating the pressure according to the requirements of service. To these ends I employ a supply-vessel C, arranged above the compressor D, the vessel being provided with an overflow-pipe *c'* and a float-valve *c*, Fig. 5, that controls the supply of water.

In order that the height of the column of water may be varied for the purpose of varying the pressure within the compressor D, and consequently within the barrel F, according to requirements, I secure said vessel to one arm of a two-armed lever *u'*, fulcrumed in a bearing *u* on the compressor-head, the other arm of said lever being suitably weighted to nearly counterbalance the vessel C when full of water, so that the altitude of the vessel C relatively to the compressor D can be varied, thereby varying the height of the column of water and consequently the pressure thereof, the vessel C being connected with the supply branch of the three-way cock K by means of the flexible pipe *d*.

With a view to effecting the displacement of the vessel from the bar-room I attach a rod, cord, or chain to said vessel or to its lever, said rod, cord, or chain u^3 being provided with a hook or ring u^3, adapted to hook onto staples or hooks *h'*, arranged one above another on the standard S, hereinbefore referred to. In Fig. 2 I have shown the ring hooked onto the upper hook, the vessel C being then at its greatest altitude. By moving the ring from hook to hook downwardly the height of the column of water between the supply-vessel C and the bottom of the compressor D, and hence the pressure exerted in said compressor, will be correspondingly reduced.

Air or, if desired, carbonic-acid gas or a mixture of air and carbonic-acid gas may be supplied to the compressor D through a suitably-valved pipe *o*. If air is employed, the pipe may be provided at its inlet with a check-valve opening inwardly. Said inlet may open into the room in which the compressing appliances are located, or it may be carried outside of the building to take fresh air from without.

The operation of my improved apparatus is as follows: The vessel C is filled with water, the three-way cock is closed, and a barrel of beer F is placed on the skid E. The spigot G and the bung-vent *i* are now inserted to establish communication between the barrel F and the compressor D through the connections *f h g* and the previously-closed stop-cock is opened. The door *a* having been closed the slides *t t'* are closed. The rod *n* is now lowered and hooked to hook *p*, thereby moving valve K to the position shown in Fig. 2. Water will now flow from vessel C into the compressor, compressing the air.

It will be readily understood that as the contents of the barrel are drawn off and the pressure in compressor D lowered water flows into the same in sufficient volume to maintain a practically constant pressure, so that the entire contents of the barrel F can be drawn off without loss of carbonic-acid gas, On the other hand, the air passing through cooler-coil *h* is cooled before being admitted to the barrel F, so that the temperature of the beer is not lowered by admission of air of higher temperature, the chest A serving the twofold purpose of cooling the forcing-fluid as well as the beer in barrel F.

When the barrel is empty, the valve-operating rod or chain *n* is hooked to hook *p'*, thereby establishing communication between the compressor D and the waste-pipe *l*, and as the water runs off a partial vacuum is produced in said compressor, whereby the air and carbonic-acid gas in the barrel F and its connections is drawn back into the compressor. The slides *t* and *t'* on the door *a* are now opened and the stop-cock *m* closed, thus preventing the escape of the air and gas from the compressor and its connections. The bung-vent *i* and spigot G are removed from the barrel, the latter lifted off the skid E, and a fresh one is placed thereon and connected up, as above described.

The capacity of the air-compressor D is in practice so chosen that all of the water contained therein is not drawn off during the re-

moval of an empty barrel and the substitution of a full one and that no water will enter the connections between said compressor and the barrel during the dispensation of the contents thereof. Should the pressure be too great, which may be the case with a freshly-tapped barrel, the vessel C is lowered until the desired pressure is attained, this being effected by lowering the rod or chain w^3 and hooking the same to the required hook h' on the standard S, as will be readily understood.

The advantages involved in my improved dispensing apparatus consist chiefly in that loss of the carbonic-acid gas is prevented and in that any remaining gas, after the contents of the barrel are exhausted, is also utilized, so that in fact but very little air is required, and by reason of these beer may be kept on tap for a much longer time without becoming flat than is the case in the prevailing mode of dispensing. Furthermore, access of foul air from the bar-room to the air-compressor is absolutely avoided, since the air can be taken either from a separate room in which the compressor is located or from without the building.

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

1. In an apparatus for dispensing liquids, the combination with an air-chamber having water inlet and outlet, a suitable valve or stop-cock for controlling the same, and a pipe leading from the air-space of said chamber, adapted to be connected with a holder for the liquid to be dispensed; of a two-armed lever above the air-chamber, a vessel on one and a balance-weight on the other arm of said lever, and a flexible pipe connecting said receptacle with the water-inlet of the air-chamber whereby the height of the vessel, and consequently the column of water relatively to the air-chamber can be varied, by varying the relative positions of the lever-arms, for the purpose set forth.

2. In an apparatus for dispensing liquids, the combination with an air-chamber having water inlet and outlet, a suitable valve or stop-cock for controlling the same, and a pipe leading from the air-space of said chamber adapted to be connected with a holder for the liquid to be dispensed; of a balance-lever above the air-space of the air-chamber, a receptacle for water on one and a balancing-weight on the other arm of said lever, said vessel in communication with a source of supply of water under pressure, means for automatically controlling such supply, and a flexible connection between the vessel and water-inlet for the air-chamber, substantially as and for the purpose set forth.

3. In apparatus for dispensing fermented liquids, the combination with a holder for the liquid to be dispensed, an air-chamber provided with a water-inlet and a water-outlet, a three-way cock controlling the same, and a pipe connecting the upper part of the chamber with the aforesaid holder; of a two-armed lever above said chamber, a vessel on one and a balance-weight on the other arm of said lever, means for varying the altitude of the vessel relatively to the air-chamber and a flexible pipe connecting the vessel with the aforesaid three-way cock, substantially as and for the purpose set forth.

4. In an apparatus for dispensing liquids, the combination with the air-compressor and a pipe for connecting the air-space thereof with a holder for the liquid to be dispensed of a two-armed lever fulcrumed in bearings on the compressor, a weight on one of said arms, a vessel on the other arm, a flexible pipe connecting the vessel with the compressor, and a locking device adapted to lock the lever against vibration on its fulcrum, for the purpose set forth.

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

ADOLF MOLDENHAUER.

Witnesses:
EMIL HENZEL,
L. ZECHMEISTER.