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BEVERAGE DISPENSING APPARATUS

2,132,011

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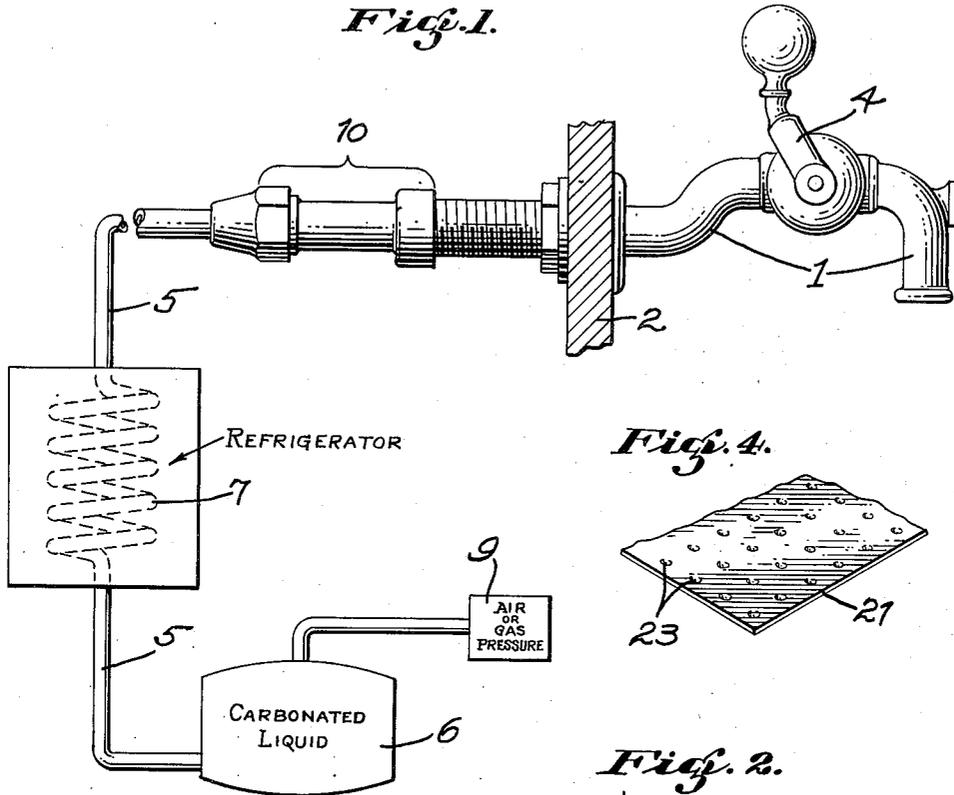


Fig. 4.

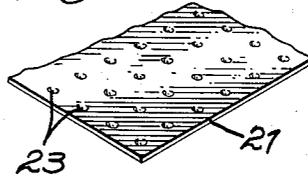


Fig. 2.

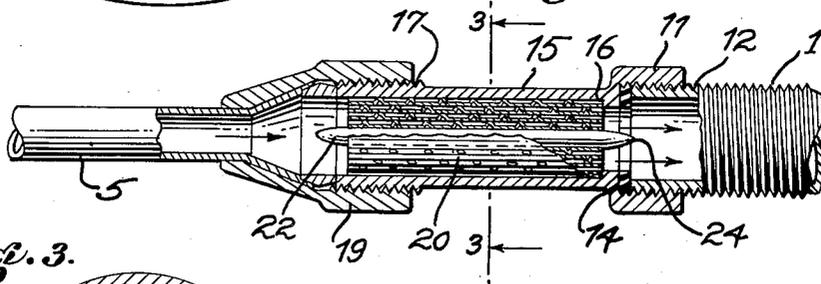


Fig. 3.

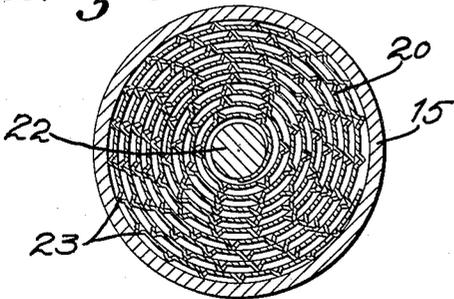
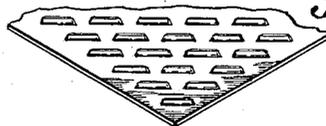


Fig. 5.



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BEVERAGE DISPENSING APPARATUS

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4 Claims. (Cl. 138—40)

Our invention relates to a pressure reduction device for use in a liquid conduit, and more especially to a device of this character well adapted for use in beverage dispensing devices such as used for dispensing beer or like carbonated liquids.

On the operation of the useful apparatus for dispensing beer or the like, the degree of pressure under which the beverage is stored is limited by the fact that the velocity with which it leaves the dispensing valve determines the character or appearance thereof in the final container. When beer is dispensed it must be done gently so as to avoid excessive turbulence, upon the degree of which depends the resultant "head". The ability to retain a maximum "head" depends not only upon the number and size of individual gas bubbles formed as a result of a pressure decrease incident to escape from the dispenser, but also upon rarity of the opportunities offered the bubbles to unite with each other. Since the number of such opportunities depends upon the turbulence, it is highly desirable to maintain this factor at a minimum value.

For the above reasons, many installations dispense beer at pressures in the neighborhood of seven or eight pounds, and thus avoid "wild" flow of beer from the valve. It is desirable to utilize higher pressures if it is also possible to dispense without turbulence.

The pressure reduction device which forms a part of our invention is of such character that pressures in the neighborhood of twenty pounds per square inch may be employed with an efficiency in pressure reduction such that turbulence is substantially eliminated.

Accordingly, among the objects of our invention are: To provide a beverage dispensing apparatus capable of dispensing under pressure with substantially complete pressure reduction, under conditions which substantially eliminate turbulence during such reduction to provide a pressure reduction device which is simple in construction and assembly and lends itself to production methods; and to provide a pressure reduction device which may be quickly replaced in service.

Other objects of our invention will be apparent or will be specifically pointed out in the description forming a part of this specification, but we do not limit ourselves to the embodiment of the invention herein described, as various forms may be adopted within the scope of the claims.

In the drawing:

Figure 1 is an elevational view, partially schematic, of a conventional beverage dispensing apparatus, modified by the pressure reduction device of our invention;

Figure 2 is a longitudinal view, partially in section, through the pressure reduction device and its conduit adapter;

Figure 3 is a partial plan view of a sheet of material prior to fabrication to form a part of the device;

Figure 4 is a sectional view on the line 44 of Figure 2; and

Figure 5 is a view similar to Figure 3, showing different spacing projections.

Referring to Figure 2, we have illustrated a beverage outlet providing a delivery conduit 1, conveniently supported as in a cabinet wall 2, and having attached thereto a valve 4, such as a beer valve. The beverage is supplied from a supply conduit 5, which is connected to a supply tank 6 through cooling coils 7, a source of pressure 9 being connected to the tank. Between the supply conduit and the delivery conduit there is provided a pressure reduction device 10, which, as more clearly understood by reference to the remaining figures, preferably comprises an adapter 11 internally threaded, as at 12, to receive the threaded end of the delivery conduit 1 against the necked down portion 14. The adapter provides a barrel section 15, having an internal shoulder 16 formed at one end thereof, and is externally threaded, as at 17, for connection to the supply conduit 5, as by a fitting 19.

Received within the barrel 15 so as to abut the shoulder 16, is a pressure reducing cylinder 20. In the preferred construction the cylinder 20 is formed by winding a band 21 of thin metal, such as shim stock, about a cylindrical core 22, the band having previously been indented over its area to form spacing projections or humps 23, as shown in Figure 3. The cylinder so formed provides a substantially continuous spiral area in cross-section, through which the liquid may pass, the spacing being maintained by the projections 23. The core 22 is preferably extended to provide a tapered or streamline termination 24 thereto, which we have found to eliminate otherwise present turbulence. The band material is preferably of a slightly resilient character, so that when inserted in the barrel 15 it tends to expand and maintain its longitudinal position therein. It is evident therefore that this spiral reducer may be used in any straight section of

conduit of comparable diameter without need for further retaining means.

As an example of a construction which we have found preferable for satisfactory operation where a pressure of twenty pounds on the beer was maintained, the barrel diameter was .560 inch and its length two and one-sixteenth inches. The cylinder 20 was formed on a brass core 22, one-eighth inch in diameter, using shim stock of .003 inch thickness, two inches wide and approximately thirty-six inches long, the indentations 23 providing a .005 inch spacing.

In observing the action of the device under actual operating conditions in a glass tube, it appears that the beer tends to adhere to the surface of the shim stock and comes out the exhaust side of the wrapped cylinder without apparent turbulence, though under as much as twenty pounds pressure at the entry point. In this regard it may be mentioned that, without the provision of a streamlined termination 24 to the core 22, slight turbulence at the center of the outgoing stream was observed. We do not, however, desire to be limited to the use of the termination 24 as the central turbulence created by its emission is not sufficient to necessitate reduced inlet pressure.

Through the use of a construction of the above character and the consequent elimination of turbulence in the escaping beer, the carbon dioxide remains absorbed for a substantial period of time, providing a fine creamy head on the dispensed liquid for a corresponding period.

While the construction described is well adapted for carrying out the objects of the invention, it is understood that various modifications and changes may be made without departing from the invention, which is considered to include all such modifications as lie within the scope of the claims.

One of such modifications, for example, may take the form of the device shown in Figure 5. Here the projections 23, instead of being of spheri-

cal contour, are elongated, and preferably arranged at an angle to the liquid flow. By changing the angle of the projections in relation to the flow, more or less turbulence may be imparted to the emitted stream, and the amount of turbulence obtained will remain constant. Thus my device not only reduces turbulence, but controls it to any predetermined value. Other shapes of projections to produce the desired result will be apparent to those skilled in the art.

We claim:

1. In a beverage dispensing apparatus, a pressure reduction device comprising a cylindrical rod, a band of indented sheet metal wound in a spiral therearound to form a fluid conduit of spiral cross-section, said rod projecting beyond the exit end of said conduit and being formed to prevent turbulence.

2. In a beverage dispensing apparatus, a conduit, a pressure reduction device therein comprising a cylindrical rod, a band of sheet metal wound in a spiral therearound, and having means integral therewith for spacing the successive layers of the band.

3. In a beverage dispensing apparatus, a conduit, a pressure reduction device therein comprising a cylindrical rod, a band of sheet metal wound in a spiral therearound, said rod projecting beyond one end of said spiral and being streamlined to prevent turbulence.

4. In a beverage dispensing device, a pressure reduction unit comprising an adapter provided with means for connecting the same in a conduit, said adapter providing a cylindrical barrel having an internal flange at one end thereof, a rod extending axially of said barrel, and a band of indented sheet metal wound around said rod to form an axial passage through said adapter having a spiral cross-section, the indentations being the sole spacing means.

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