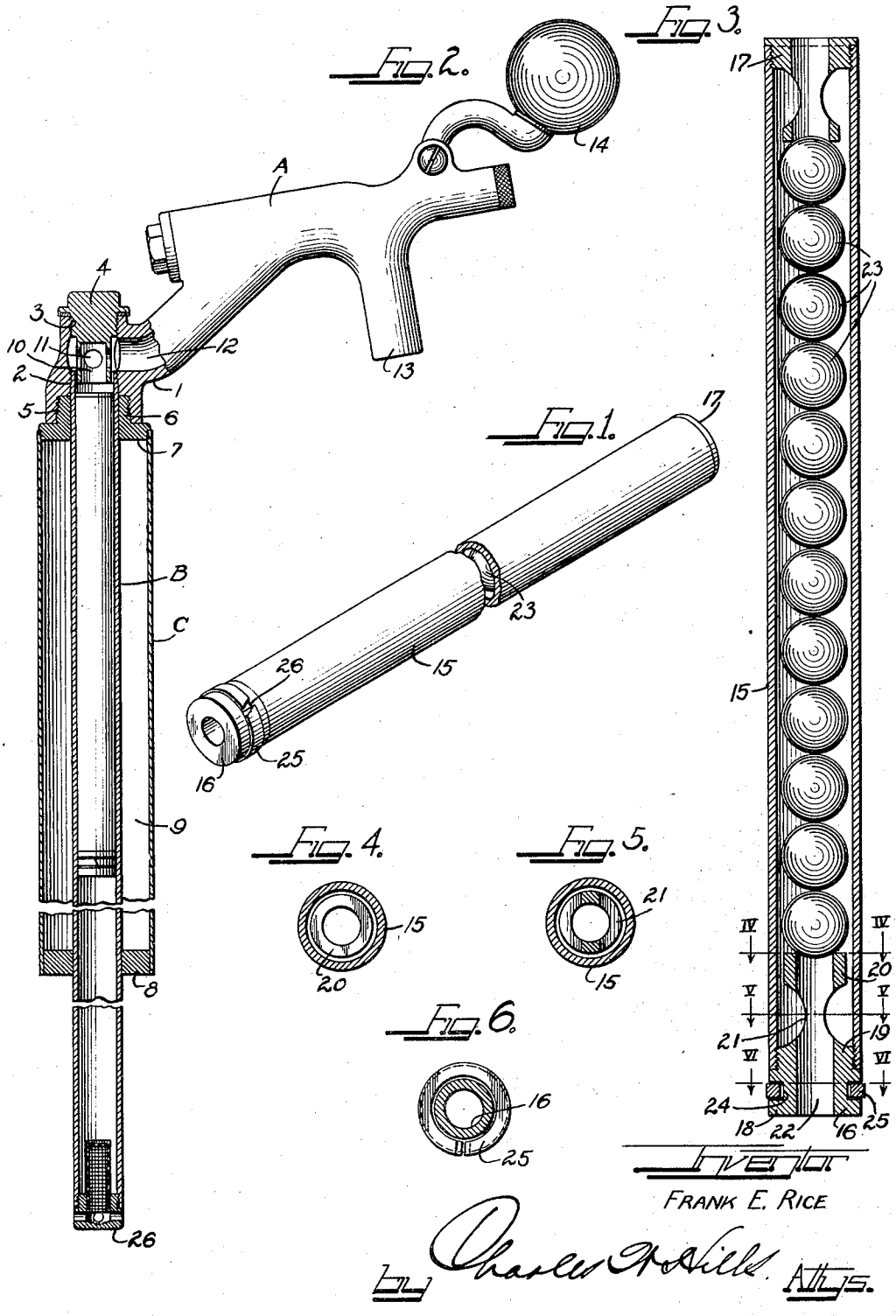
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DIRECT DRAWROD

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DIRECT DRAWROD

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The present invention relates to a direct drawrod and more particularly to a unitary device which is installed as a self-contained flow restrictor, which device may be inserted in any tube or drawrod of suitable diameter for restricting flow through such tube or rod.

Recent developments in beer and ale dispensation have been directed towards means for directly drawing the beer from a keg or barrel to a glass or stein for consumption on the premises. In order to so dispense beer, it is necessary that means be provided for reducing the pressure of the beer as it leaves the keg or barrel and enters a glass or stein, so that the force of the discharged beer will not be such as to drive it out of the glass or stein and also as not to form too much foam in the glass or stein or other receptacle into which it is discharged from the faucet.

Inasmuch as the amount of pressure created in beer barrels or kegs varies with the individual bartenders, some sort of restricting means must be utilized in the draft tube or rod.

The present invention has for an object the provision of a restrictor adapted to be inserted in a draft tube or rod for controlling liquid flow therethrough, together with means for frictionally retaining the restrictor in place.

Another object of the present invention is to provide a unit device which in itself is formed with flow restricting means in it, and which device may be inserted in a pipe, tube or draft rod and therein held by friction.

A further object of the present invention is to provide a restrictor in the form of a cartridge having self-contained means for restricting flow through it, which cartridge is insertable in a draft tube or rod, and which cartridge carries a split expansible and contractible ring for frictionally engaging the wall of the tube or rod to hold the cartridge in place.

A still further object of the present invention is to provide a self-contained flow restrictor insertable in a tube or pipe with a close fit, equipping the restrictor with a split ring to hold it in place in the tube or rod, and providing a plurality of shiftable restricting members within the device which are shiftable by the force of liquid flowing through the device, to thereby agitate such members sufficiently to make the device self-cleaning.

The invention has for an additional object the provision of a tubular member, apertured end caps for fluid entrance and exit, and a column of balls between the caps offering maximum frictional surface area for a given length of tube.

The invention contemplates as an additional object the provision of restrictors made in stock sizes for insertion in stock-sized draft tubes or rods of beer and like dispensing apparatus, which restrictors are internally provided with restricting means for liquid flow.

A still further object of the present invention is to provide a restrictor for insertion in a draft tube or rod of suitable internal diameter, which restrictor takes the form of a cylindrical tubular member having end members providing for fluid entrance and exit, and provided with a plurality of balls arranged and retained in column form within the tube between the ends, constituting restricting means. The utilization of the column arrangement of the balls provides alternating maximum and minimum spaces through which liquid passes, to thereby reduce the turbulence in the liquid issuing from the draft tube or rod in which such restrictor is inserted.

Generally speaking, the restrictor of the present invention comprises a tubular member having end members which are bored for liquid entrance and exit, and arranged within the tube between the end members is a single column of balls of such size as to be retained in column form, yet at the same time allow a slight amount of play so that when beer passes through the tube the balls will be shifted slightly, one with respect to another, thereby maintaining the surfaces of the balls sufficiently clean for long periods of time.

The device of the present invention has been found very useful in direct draw tapping systems for beer and other carbonated beverages in so controlling flow that the beer or other beverage issues from the faucet without turbulence and without excessive foam, and at a pressure substantially below that present in the barrel or keg.

The above, other and further objects of the present invention will be apparent from the following description and accompanying drawing.

The accompanying drawing illustrates an embodiment of the present invention, and the views thereof are as follows:

Figure 1 is a broken isometric view of a restrictor showing it as it is ready for insertion in a draft tube or rod.

Figure 2 is a view partially in longitudinal section through a draft tube or rod and an elevational view of a faucet, showing the restrictor of the present invention in elevation and inserted in the draft tube or rod near the end of the tube or rod which is adjacent the faucet.

Figure 3 is an enlarged longitudinal axial sec-

tion through the restrictor, showing the end members and the single column of balls arranged between the end members.

Figure 4 is a transverse sectional view taken substantially in the plane indicated by the line IV—IV of Figure 3, with the adjacent ball removed.

Figure 5 is a transverse sectional view taken substantially in the plane indicated by the line V—V of Figure 3.

Figure 6 is a transverse sectional view taken substantially in the plane indicated by the line VI—VI of Figure 3.

The drawing will now be explained.

Figure 2 illustrates a direct draw tap rod or tube device for directly drawing beer from a keg and discloses a faucet structure represented generally at A, a draft tube or rod B with a shell C surrounding the upper end of the tube or rod B adjacent the faucet A, which shell is utilized for heat insulating the portion of the draft tube or rod between the beer barrel and the faucet A. As illustrated, the faucet structure A is of conventional form and arrangement and is provided with a neck 1 having a threaded opening 2 for receiving the upper end of the draft tube or rod B in connected relationship. Above the portion 2, the neck is bored and threaded at 3 to receive a closure plug 4. Below the threaded portion 2, the neck is internally bored and threaded at 5 to receive the threaded portion 6 of a closure member 7 which surrounds the draft tube or rod B and to which the upper end of the shell C is secured in any suitable manner. The lower end of the shell C is closed by an end member 8 which surrounds the draft tube or rod B and is suitably secured to the lower end of the shell. This construction provides a space 9 surrounding the draft tube or rod B within the length of the shell, useful for insulating purposes.

As constructed, the plug or cap 4 has a downwardly extending cylindrical skirt portion 10 provided with apertures 11, which portion is shown as entered within the upper extremity of the draft tube or rod B, with the apertures 11 in register with the hollow portion 12 of the neck, so that beer may enter the faucet structure A for dispensation through the nozzle 13 as the handle 14 is manipulated in the usual manner.

The restrictor of the present invention comprises a tubular body 15 having open ends, which ends are interiorly threaded to receive end members 16 and 17. The end member 16 is at the entrance end of the body 15 and is shown as having a head portion 18, the diameter of which coincides with the outer diameter of the tubular body 15, and a reduced portion 19 exteriorly threaded to engage the threads in the end of the tubular body, as shown. Inwardly of the portion 19, the end member has a neck portion 20 of less diameter than the interior diameter of the tubular body 15, with that portion of the end member between the portions 20 and 19 provided with lateral openings 21. The interior of the member 16 is bored, so that fluid may enter from below, as viewed in Figure 3, to the interior of the tubular body through the lateral outlet 21 as well as through the bore 22. The fact that the outer diameter of the neck portion 20 is less than the interior diameter of the tubular member allows the liquid to enter the interior of the body above the cap or end member, as viewed in Figure 3, and as carried out in practice when such device is constructed in a draft tube or rod, such as illustrated in Figure 2.

The end member 17 at the upper or opposite end of the tubular body 15 is of like construction, except as to dimensions, and constitutes liquid exit from the tubular body 15.

Confined within the tubular body 15, between the end members 16 and 17, in columnar form, are balls 23. The diameters of the balls 23 are such that the balls retained in columnar form, and yet permitted slight displacement from the vertical, so that a slight shifting movement may take place between adjacent balls, due to force of fluid passing through the body 15, which movement is found useful in keeping the surfaces of the balls clean.

The head 18 of the entrance end cap 16 is provided with an annular recess 24. In this recess is a split ring 25, which ring is expansible and contractible, in a manner well understood. The ends of the ring at the split are preferably inclined as at 26. Normally, when the device or restrictor is out of a tube or rod, the ring 25 is expanded so that its exterior diameter is greater than the exterior diameter of the end member 16 and the tubular body 15, as illustrated in Figure 1, and which is well understood.

When the device is inserted in a tube or rod, the ring is compressed and, because of its tendency to expand, seals the joint between the restrictor body 15 and the interior wall of the tube or rod B to prevent entry of liquid into this space. At the same time the function of the ring is to frictionally hold the restrictor in place within the draft tube or rod B.

By the means of the construction just described, it will be apparent that the restrictor may be placed anywhere within the length of a draft tube or rod and function perfectly. Such invention is accomplished by provision of the split ring 25.

It is quite obvious, therefore, that all liquid entering the lower end of the draft rod or tube B, through the apertured end closure member 26 will have to pass through the interior of the restrictor, entering through the entrance end member 16 and escaping through the exit end member 17, and thence to the faucet A.

Utilization of a series of balls arranged in columnar form provides alternating areas of maximum and minimum extent, providing a plurality of such spaces, thereby preventing turbulence of the liquid issuing from the nozzle 13 whenever the valve in the faucet A is opened by manipulation of the handle 14. Furthermore, the provision of these alternating areas of maximum and minimum reduces the pressure or velocity of the liquid passing through the tubular body 15, so that the beer issues from the faucet 13 in a quiescent condition without too much foam and under low pressure.

It is to be understood that the maximum and minimum areas, just described, depend on the diameters of the balls and the inside diameter of the tubular body 15.

The exterior diameter of the tubular body 15 is designed to snugly fit within the draft tube or rod B.

The end members 16 and 17 are preferably threaded into the ends of the tubular body 15 so as to be removable, to thereby enable disassembly of the complete restrictor structure for proper cleaning and replacement of worn parts, if such becomes necessary.

It has been found in practice, however, that

these end members might be permanently secured to the ends of the tubular body, as there is sufficient agitation of the balls occasioned by the force of the liquid entering the tubular body to maintain the same in clean condition.

The force of the liquid passing through the tubular body 15 tends to rotate the several balls. Such tendency is utilized, as before stated, in maintaining the cleanliness of the interior of the body. The disposition of the single column of balls is such that the columnar form is preserved while allowing slight relative movement, so that there is no probability of the restrictor becoming inoperative.

The areas of minimum amount are substantially in line with the diameters of the balls, and the areas of maximum amount in the tangent between any two balls. The curvatures of the balls cooperate with the interior wall of the tubular body 15 to provide these spaces, as described, so that the liquid passing through the tubular body from its entrance end to its exit end is passed successively through these areas of maximum and minimum extent.

Referring to Figure 3, it will be apparent that liquid entering the restrictor through the entrance member 16 will be separated, some issuing through the apertures 21 in the side and another stream issuing through the upper end adjacent the lowermost of the balls, perhaps displacing this ball sufficiently for escape to the interior of the body.

The columnar form of balls as illustrated in Figure 3 is the position assumed by the balls as liquid is flowing through the tubular body 15 under pressure at its entrance end. It is to be understood that when the device is held vertically, as it is when in place in a draft tube or rod, and no liquid is passing through the device, the balls move slightly out of the position shown, some resting against the walls of the tubular body. In such event, the uppermost ball would fall slightly away from the upper or exit end member 17. However, the space between the balls is such that under the said circumstances one ball will not become displaced with reference to its next one, so that the column will remain generally in the form illustrated.

The gist of the present invention resides in the provision of a member having self-contained flow restricting means, which member may be inserted as a unit structure in a draft tube or rod for controlling flow through the tube or rod, without preparing the tube or rod in any manner for retaining the member.

The invention has been described herein more or less precisely as to details, yet it is to be understood that the invention is not to be limited thereby, as changes may be made in the arrangement and proportion of parts, and equivalents may be substituted, without departing from the spirit and scope of the invention.

The invention is claimed as follows:

1. A pressure reducer comprising a tubular member insertable in a draft tube or rod, a single column of balls within said member providing a maximum frictional surface area for a given length of said member, end closures in said member, said end closures having neck portions extending into the tube and constituting seats for retaining said balls in place, each of said end closures having a liquid passageway therethrough, and one of said end closures being provided with an exterior friction ring for holding the member in place in a draft rod.

2. In a conduit for conveying carbonated beverages having a dispensing faucet at its discharge end, a device comprising a tubular member, a column of balls within said member, each of said balls having a diameter slightly less than the inside diameter of said tubular member, end closures in said member each having neck portions extending thereinto, said neck portions arranged to provide laterally extending openings and an end seat for an adjacent ball, and a frictional ring for holding said device in place when in combination with said conduit, said balls having diameters whose total equals the space between the seats of said end closures and which are free to move laterally for revolution thereby decreasing their total length, said balls being arranged to provide a pressure reducing liquid flow passageway through said device.

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