

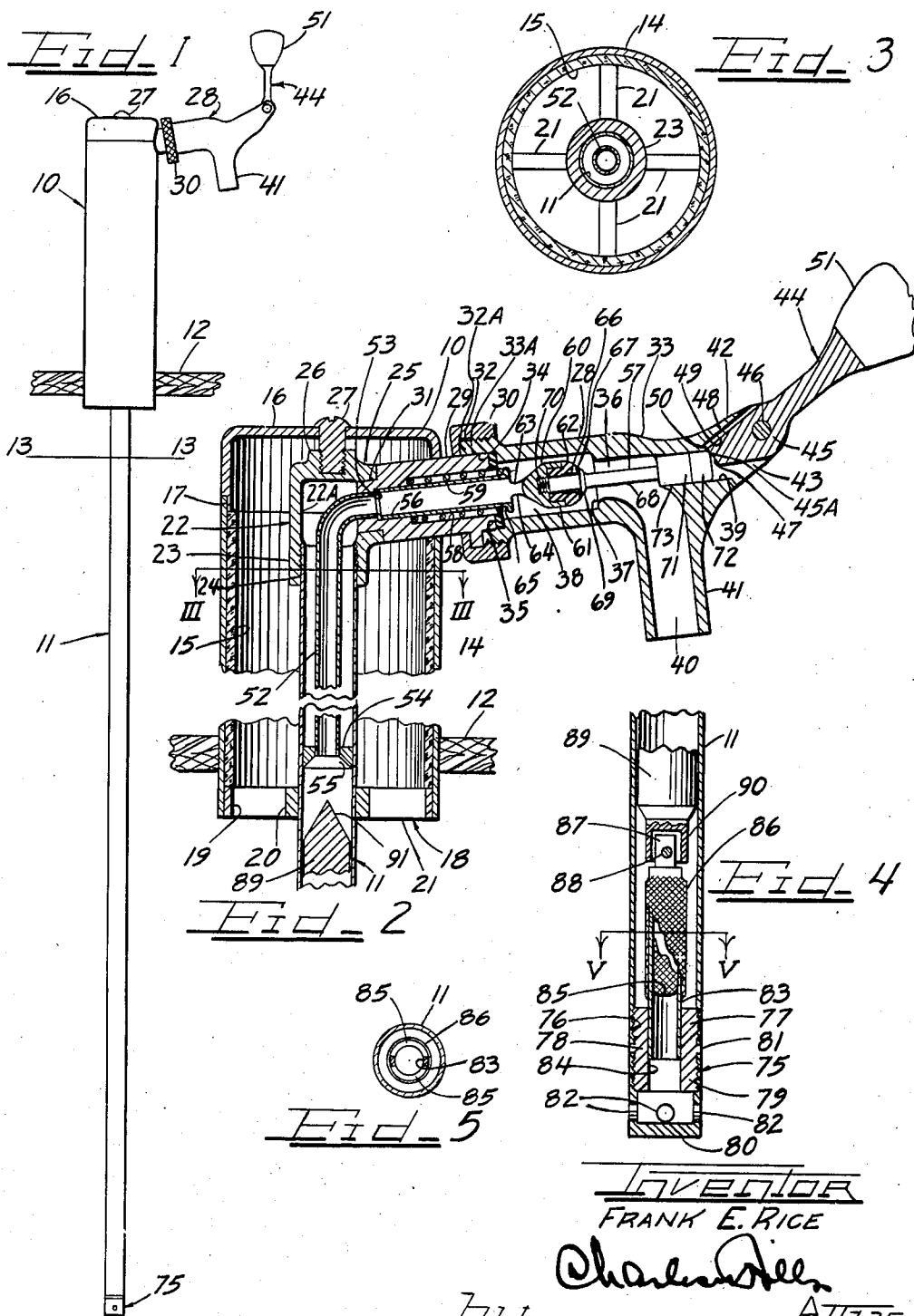
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DIRECT DRAW FAUCET ASSEMBLY

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DIRECT DRAW FAUCET ASSEMBLY

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The present invention relates to a beverage faucet and more particularly to a beer faucet which is so constructed as to insulate, from room temperatures, a small volume of beer trapped therein during periods of inactivity.

At the present time, great difficulty is experienced in providing faucets for carbonated beverages which will assure the drawing of a single glass of the beverage at the proper temperature and carbonation after the faucet has remained idle and has been exposed to room temperatures for a period of time. This is particularly true when the beverage is beer. During warm weather, even an idle period of fifteen minutes will result in the first glass of beer being unsalable due to excess foam and increased temperature of the liquid. As the solubility of carbon dioxide gas decreases as the temperature increases, the beer contained in such a faucet will lose much of its carbonation and the free gas will form pockets which causes spitting or sudden bursts of liquid when the faucet is opened, with the result that excess foam is formed as the beer is being drawn.

While this problem may be solved satisfactorily by refrigerating or cooling the casing of the faucet, the results are unsatisfactory due to the increased manufacturing costs and complications in fabrication of this type of faucet.

It is, therefore, an important object of the present invention to eliminate these objections by providing an inexpensive and unrefrigerated faucet assembly.

Another object of this invention is to provide an insulated faucet assembly which holds a very small volume of beverage therein during periods of inactivity.

A further object of this invention is the provision of an unrefrigerated faucet assembly of thin and light metal parts which permits the drawing of a salable glass of beverage with the proper amount of foam and at the proper carbonation and temperature even after hours of standing without operation.

A still further object of this invention is the provision of a novel handle and valve construction which cooperate with cam action.

Another and still further object of this invention is the provision of a handle and valve construction in which the handle is automatically returned to a closed position of the faucet when operated but partially between its operating limits and which may be actuated to a fully opened position of the faucet and retained in that posi-

tion until manually returned part way in which the faucet is again automatically closed.

The novel features believed to be characteristic of the present invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and manner of construction, together with further objects and advantages thereof may best be understood by reference to the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevational view of a faucet and draught tube assembly embodying the principles of this invention;

Figure 2 is an enlarged broken vertical cross-sectional view of the faucet shown in Figure 1;

Figure 3 is a horizontal cross-sectional view taken substantially along the plane indicated by the line III—III of Figure 2;

Figure 4 is an enlarged fragmentary vertical cross-sectional view of the lower end of the draught tube shown in Figure 1; and,

Figure 5 is a horizontal cross-sectional view taken substantially along the plane indicated by the line V—V of Figure 4.

The device illustrated in Figure 1 generally comprises a faucet assembly 10 and a draught tube 11. A portion 12 of a refrigerating box is illustrated only for the purpose of showing the major portion of the faucet assembly 10 as being exposed to room temperatures. The connection between the faucet assembly 10 and the refrigerating box forms no part of this invention and therefore will not be described. A line 13—13 represents the general position of the top of a beer barrel through which the draught rod 11 is inserted. No connection between the faucet assembly 10 or the draught rod 11 is shown with the top of the beer barrel as it forms no part of this invention.

As best shown in Figure 2, the faucet assembly 10 comprises a tubular shell 14 lined on its inner side with cork 15 or other insulating material. At the upper end of the shell there is provided a closure cap 16 having a lower portion 17 of reduced diameter for abutment insertion within the shell. While no insulating material has been shown for lining the cap 16, cork or other similar insulation may be used if desired. A spacer bushing 18 is inserted within the lower end of the shell 14 with its outer face in flush relation with the lower edge of the shell. This bushing is provided with a peripheral wall 19 for engagement with the inner surface of the shell 14 and a central apertured bushing 20 for receiving there-

through the draught tube 11. As best shown in Figure 3, the bushing 20 is connected to the peripheral wall 19 by means of a plurality of ribs 21. As the side walls of the draught tube 11 are too thin to permit the draught tube to be pressed through the central aperture of the bushing 20, the draught tube is connected to the bushing by solder or other suitable means.

The upper end of the draught tube 11 is threaded for connection to an internally threaded elbow member 22. As shown in Figure 2, the elbow 22 is provided with a downwardly extending leg 23 which is internally threaded as at 24 for connection to the draught tube as previously described. A shorter leg 25 is disposed in angular relation to the leg 23 for a purpose to be more fully described hereinafter. The side walls of the elbow 22 are apertured as at 22A to allow for air circulation through the elbow and downwardly within the draught tube 11. The top wall 26 of the elbow 22 is thickened and provided with a threaded recess into which is inserted a cap screw 27 for the purpose of aiding in the support of the elbow by the cap 16. It is to be noted that the connection between the bushing 18 and the draught tube 11 together with the connection between the cap screw 27 and the elbow 22 provides an axial support by the faucet body at its end portions of the operative structure of the faucet device.

A nozzle assembly 28 is formed as a union with a female coupling portion at one end formed by a coupling sleeve 29 and an internally threaded coupling nut 30. The sleeve 29 is provided at one end with a reduced portion 31 which is pressed into the short hollow leg 25 of the elbow member 22. If desired, this connection can be made more positive by soldering, welding, threading or the like. An outwardly extending flange 32 is provided adjacent the opposite end of the coupling sleeve against which the inner shoulder of the loosely swiveled coupling nut 30 abuts when threadedly connected to the nozzle proper 33. The outer surface of the coupling nut 30 is knurled as shown in Figure 1, to provide a rough surface for aiding in turning the nut by hand when the parts are connected together.

The nozzle 33 forms the male portion of the union nozzle assembly 28. One end of the nozzle 33 is provided with exterior threads for engagement with the interior threads of the coupling nut 30 whereby a tightening of the coupling nut draws the end of the nozzle 33 into abutment with the outer face of the flange 32. In order that the coupling sleeve 29 and the nozzle proper 33 be connected in proper alignment so that the faucet faces downwardly as shown in Figure 1, a slot 32A is provided in the flange 32 of the sleeve 29 for receiving therein a forwardly extending lug 33A on the threaded end of the nozzle 33.

A recess 34 is provided at the threaded end of the nozzle 33 for receiving therein the end of the sleeve 29, and a sealing washer 35 is interposed between the end of the sleeve 29 and the shoulder formed at the end of the recess 34 to provide a fluid-tight joint when the union parts comprising the nozzle assembly 28 are connected together.

At an intermediate inner portion of the nozzle 33, there is provided a reduced passageway 36 forming a valve seat 37. Between the valve seat 37 and the recess 34 there is provided a valve chamber 38 whose purpose is to be described more fully hereinafter.

The reduced chamber 36 is continued in two angularly extending branches, one of which extends in an axial direction in a reduced guide cylinder 39 and the other continued in an angular direction therefrom in a nozzle opening 40 which is formed by the tap or spigot 41.

The outwardly extending end of the nozzle 33 terminates in a portion of U-shaped configuration in cross-section having a web 42 and spaced parallel side walls 43, only one of which is shown in Figure 2.

A handle member 44 is provided at one end with a cam portion 45 which is pivotally connected to and between the side walls 43 by means of a screw or pivot pin 46. Substantially right-angularly extending cam surfaces 47 and 48 are provided respectively at the end and top edge of the cam end 45, to form a slightly rounded corner 45A therebetween. As best shown in Figure 2, when the pivoted handle 44 is rocked to the position illustrated, the cam surface 48 moves into engagement with the offset inner surface 49 of the web portion 42. A shoulder 50 is provided thereby for engaging a portion of the cam surface 47.

A ball handle or grip 51 is provided at the end of the member 44 opposite the cam end and which is grasped when the handle is to be rocked about its pivot 46. The handle 51 may be formed of any suitable material and it is preferred that it be formed of a suitable colored plastic which contrasts with the metal finish of the faucet assembly.

A fluid tube 52, of smaller diameter than the inside diameter of the draught tube 11, has one end inserted within a portion of the end 31 of the coupling sleeve 29. The inserted end is flared slightly outwardly as at 53 to eliminate the possibility of the tube 52 being pulled out of engagement from within the sleeve 29. The tube 52 is then bent angularly downward to pass through the elbow member 22 and a portion of the draught tube 11 in coaxial alignment therewith. A bushing 54 is sweat into place or otherwise suitably secured to the inner surface of the side walls of the draught rod 11 to tightly embrace a portion of the lower end of the fluid tube 52. This connection provides a fluid-tight joint between the tubes 11 and 52 and, together with the connection of the tube at its other end 53, supports the fluid tube in its coaxial relationship with the draught tube 11. The washer 54 has an inner outwardly flared surface 55 connecting the end of the tube 52 with the inner surface of the draught tube 11 for the purpose of eliminating pockets between the different sized fluid passageways defined by the draught tube 11 and the fluid tube 52.

The inner bore of the coupling sleeve 23 adjacent the end 53 of the fluid tube 52 is arranged to slidably receive a portion of the tubular shank end 56 of the valve assembly 57. Adjacent the sliding bore is a bore 58 of increased diameter sufficiently large to retain a coil spring 59 which embraces the tubular valve end 56.

The valve assembly 57 comprises a head 60 of circular cross-section having at one end a recess for receiving therein the reduced end portion 61 of a rubber valve member 62. The outwardly extending end of the rubber valve 62 is rounded for the purpose of seating against the edge of the seat 37 defined between the differently sized chambers 36 and 38.

The opposite end of the head 60 terminates in the tubular portion 55. Portions of the head 60,

adjacent the tubular portion 56, are cut out to provide orifices 63 and 64 which communicate with the interior of the tubular end 56, thereby providing a fluid flow passageway from the fluid tube 52 into the chamber 38. The reduced tubular end 56 forms a shoulder 65 in its connection with the valve head 60 to provide an abutment for one end of the coil spring 59 whose other end seats at the end of the enlarged bore 58 in the sleeve 29.

The valve 62 has been described as being of rubber. It is to be understood, however, that the use of any other suitable material for the purpose of seating on the seat 37 is within the scope of this invention. The rubber valve 62 is maintained in its seated engagement within the head 60 by means of a flanged shaft. The rubber valve 60 is provided with a central aperture into which partially extends a bearing bushing 66 having an outwardly extending flange 67 at one end thereof for abutment against the outer end of the rubber valve. A shaft 68 is formed to provide a flange 69 adjacent an end thereof. The extremity of the shaft is threaded as at 70 for engagement within a second recess formed at the bottom of the head recess which seats the reduced end 61 of the rubber valve. The second recess is provided with threads into which the threaded end of the shaft 68 is inserted and when so connected the shaft flange 69 abuts against the flange 67 and the bearing bushing 66.

At the other end of the shaft 68, there is provided a guide portion 71, the outer end 72 of which is preferably formed integral with the shaft and is of increased diameter. The shaft immediately adjacent the outer end portion 72 is of decreased diameter to receive an embracing sleeve 73 which is pressed thereon. This sleeve is of the same diameter as the outer end 72 and is preferably formed of brass or other similar and softer material. The end 72 and the sleeve 73 together form a guide which slides within the guide cylinder 39. The guide 71 together with the reduced tubular end portion 56 guides and axially supports the rubber valve 62 in its movement toward and away from the valve seat 37. It is to be noted that the diameter of the valve chamber 38 is larger than that of the valve head 60 to permit fluid to flow thereby into and through the spigot 41 when the valve is moved away from its seat 37.

When the handle 44 is in a vertical position as illustrated in Figure 1, the valve assembly 57 is in a position in which the rubber valve 62 is seated against the seat 37 to close the faucet against fluid flow. By rocking the handle to the right or in a clockwise direction about its pivot 45, the end portion 72 of the shaft 68 slides along the guide cylinder 39 by reason of its cam engagement with the corner 45A at the end of the handle between the cam surfaces 47 and 48. As long as this cam engagement is between the corner 45A and the shaft end portion 72, the pressure of the coil spring 59 will be sufficient to rock the handle 44 back to its normal or vertical closed position by reason of the handle corner lying below the pivot 45. However, if the cam corner 45A is operated above the end portion 72 so that the latter engages against the end cam surface 47, then a release of the handle 44 will not effect a return of the handle to its vertical position. The angularity of this cam engagement, as shown in Figure 2, is such that compression of the coil spring 59 tends to urge the edge cam surface 48 into engagement with the

inner or offset surface 49 of the web 42. In other words, compression of the coil spring 59 will automatically rock the handle back to its vertical or closed position providing the handle is not rocked to a position in which the cam corner lies above the upper edge of the outer end 72 of the shaft 68. When the cam corner is rocked above the outer end 72 of the shaft, compression of the coil spring 59 will maintain the handle 44 in a position in which the nozzle is open for fluid flow through the spigot 41.

In view of the cam action between the end of the handle 44 and the outer end 72 of the shaft 68, the reason for providing the end 72 as an integral portion of the shaft becomes obvious and is for the purpose of reducing to a minimum the constant sliding cam engagement between the parts. The sleeve 73 is provided of brass or other suitable and softer material to eliminate the possibility of scoring the guide cylinder 39.

Figure 4 illustrates a filtering unit 75. The lower end of the draught rod 11 is internally threaded as at 76 for receiving therein one end 77 of a nipple 78. The opposite end 79 of the nipple is exteriorly threaded similar to the end 77 for the purpose of threadedly receiving therearound an end cap 80. It is to be noted that the exterior threads on the ends 77 and 79 of the nipple are separated by an outwardly extending flange 81 which abuts on one side against the lower end of the draught tube 11 and on its other side is engaged by the edge of the end cap 80. A plurality of openings 82 are provided in the side walls of the end cap 80 for the purpose of defining fluid flow passageways into the interior thereof.

A short tubular nipple 83 has an end portion pressed into the inner bore 84 of the nipple 78. If desired, the nipple 83 may be soldered, welded, brazed or similarly and more positively secured within the nipple 78. Suitable elongated apertures 85 are provided in the side walls of the tubular nipple 83 which extend above the nipple 78. A screen 86, or other suitable filtering means, is formed to embrace the sleeve portion of the tubular nipple 83 to thereby cover the apertures 85.

The upper end of the tubular nipple 83 is formed as a reduced portion 87 through which a transversely extending pin 88 extends outwardly from opposite side surfaces thereof.

A throttling tube 89 is provided at its lower end, as shown in Figure 4, with a reduced portion 90, which floatingly embraces the reduced end 87 of the tubular nipple 83. Suitable apertures (not shown) are provided in the side walls of the reduced end portion 90 through which extend the ends of the pin 88 to pivotally connect the tubular nipple 83 to the throttling rod 89. The upper end of the floating throttling tube 89 is pointed as at 91 (see Figure 2) for the purpose of guiding fluid flowing around the floating tube as it enters the unrestricted inner portion of the draught tube 11. As shown in Figures 2 and 4, the floating tube 89 has a smaller outside diameter than the inside diameter of the draught tube 11 for the purpose of acting as a floating restriction to throttle the fluid stream as it flows upwardly through the draught rod. The position of the pointed end 91 on the floating tube 89 with respect to the draught tube 11 and the faucet assembly 10 will depend entirely on the length of the floating tube and the amount of restriction desired within the draught tube.

Inasmuch as the carbonated beverage, such as

beer, is confined in a barrel under pressure, the beverage will flow through the opening 82 in the end cap 80, upwardly through the tubular nipple 83 and the screen 86 into the draught tube 11. The beverage will then pass around the floating restrictor 89, into the fluid tube 52, and through the valve tubular end 56 into the chamber 38. The beverage remains trapped within the chamber 38 until the handle 44 is actuated to force the valve 62 away from its seat 37. When the valve is opened, the beverage flows through the nozzle 41 into a glass, stein, or other beverage container. As shown in Figure 2, it will be noted that the volume of trapped beverage within the fluid tube 52, the tubular end 56 of the valve structure, and the chamber 38 is very small. By actual measurement this volume of fluid has been found to be 8 cc. and is the amount of fluid which is exposed to room temperatures when the faucet stands idle. Any fluid trapped within the draught tube 11 below the fluid tube 52, will naturally be exposed to the refrigeration of the box 12. If the faucet device were allowed to stand for any length of time, the temperature of the trapped 8 cc. of fluid would materially increase. As soon as the handle 44 is moved to a position in which fluid or beverage is drawn through the nozzle, the cooled fluid within the draught tube 11 immediately chills the fluid tube 52 and the adjacent valve and nozzle structures. As the volume of 8 cc. would be but a small portion of a glass of beverage, it is obvious that the temperature of the entire glass of beverage would vary very little from the temperature of the beverage contained in the cooled draught 11. Furthermore, the volume of trapped fluid exposed to room temperatures is so small that the amount of free carbon dioxide gas liberated as the temperature of the trapped liquid increases would be so small that the usual spitting or sudden bursts of liquid as the nozzle is opened would be entirely lacking. By reducing the amount of free carbon dioxide gas, the objection to excess foaming in drawing beverage through the faucet is entirely eliminated.

The provision of insulation within the faucet retards the absorption of heat by the trapped fluid within the fluid tube, the tubular end of the valve structure and the chamber 38.

From the foregoing description, it will be observed that a faucet and draught tube assembly has been provided herein which is simple in construction, requires no refrigeration of the faucet and which automatically maintains the temperature and carbonation even of a first glass of beverage drawn after the faucet has been allowed to stand exposed to room temperatures for long periods of time. In fact, actual tests have been made in which the carbonation and temperature of a first glass of beer was found to be substantially the same after the device had stood unused for a period of twenty hours.

While a particular embodiment only of this invention has been illustrated, it will, of course, be understood that the invention should not be limited thereto, since many modifications may be made and, therefore, it is contemplated by the appended claims to cover all such modifications as fall within the true spirit and scope of the present invention.

I claim the following:

1. A draught device for connecting a source of fluid supply and a faucet, comprising a tubular body having a closed end and an open end, inner and outer tube constructions mounted in said

body, said outer tube construction having openings therein for the circulation of air in the body between said tube constructions, a coupling member connected at one end to said tube constructions and having its other end arranged for connection to a faucet, and a closure valve having a tubular shank in said coupling member slidable toward and away from said tube constructions, said inner tube construction and the tubular shank on said valve defining a restricted fluid flow passageway of small volume.

2. A draught device for connecting a source of fluid supply and a faucet, comprising an insulated tubular body having a closed end and an open end adapted to be inserted into a refrigerated box for the source of fluid supply to define an insulated chamber communicating with the box, a draught tube extending through the open end of the body into said chamber, a hollow member in said chamber on the end of the draught tube and having apertures joining the chamber with the interior of the draught tube, a coupling sleeve extending through a side wall of the tubular body and having one end connected to said hollow member and its other end arranged for connection to a faucet, an inner fluid conveying tube within and spaced from said draught tube and extending into said coupling sleeve and arranged for directing fluid from the draught tube through the chamber to the coupling sleeve while refrigerated air in the chamber can flow through the apertures of the hollow member around the inner tube, and a closure valve having a tubular portion in said coupling member slidable toward and away from said inner tube, said inner tube and tubular valve portion defining a restricted fluid flow passageway of small volume.

3. A draught device for connecting a source of fluid supply and a faucet, comprising a tubular insulated shell having one end adapted to be inserted into a refrigerated box for the source of fluid supply, a removable cap on the other end of said shell, a hollow elbow fitting carried by said cap and having openings in the side walls thereof, a draught tube connected to said one end of the shell and extending into the shell and connected to one end of the elbow fitting, a coupling member extending through a side wall of said shell and having one end connected to the other end of said elbow fitting and the other end of the coupling member being arranged for connection to a faucet, an inner tube of smaller diameter than and within said draught tube and extending through said elbow member into said coupling member, and a closure valve having a tubular portion in said coupling member slidable toward and away from said inner tube, said inner tube and tubular valve portion defining a restricted fluid flow passageway of small volume.

4. A draught device for connecting a source of fluid supply and a faucet, comprising an insulated tubular body having a closed end and an open end adapted to be inserted into a refrigerated box for the source of fluid supply, a draught tube mounted in said tubular body and projecting therefrom for insertion into said source of supply, a filter and flow restriction construction in the projecting portion of the draught tube, a hollow apertured member between the closed end of said tubular body and the end of the draught tube in the body, a coupling sleeve extending through the body having one end connected to said hollow member and its other end arranged for connection to a faucet, an inner tube within

said draught tube having one end connected to an intermediate portion of the draught tube and its other end extending into said coupling sleeve, and a closure valve having a tubular portion in said coupling sleeve slidable toward and away from said inner tube, said inner tube and tubular valve portion defining a restricted fluid flow passageway of small volume.

5. A draught device for connecting a source of fluid supply and a faucet, comprising an insulated tubular body having a closed end and an open end adapted to be inserted into a refrigerated box for the source of fluid supply, a draught tube extending into said body and being carried thereby at its open end, a filter and restriction construction in said draught tube, a member secured in said body having apertured side walls and hollow angularly extending legs with one of said legs being connected to said draught tube, a faucet coupling sleeve extending through a side wall of the body and connected to the other leg of said hollow member, an inner tube within and concentric to said draught tube having one end connected to an intermediate portion of the draught tube and its other end extending into said coupling sleeve, and a closure valve having a tubular portion in said coupling sleeve slidable toward and away from said inner tube, said inner tube and tubular valve portion defining a restricted fluid flow passageway of small volume.

6. A direct tapping draught tube structure for drawing fluid from a barrel or the like within a refrigerated box, comprising a hollow shell having an open end arranged in communication with the interior of the refrigerated box for circulation therebetween, a tubular construction carried by and extending through said shell and having one end inserted in the barrel and the other end thereof adapted for connection to a faucet, and a second tubular construction of smaller diameter than said first tubular construction mounted within and extending intermediate the ends of the first tubular construction, said first tubular construction having openings therein exposing said second tubular construction to refrigerated circulation from said shell.

7. A direct tapping draught tube structure for drawing fluids from a barrel or the like, comprising an insulated casing having an open end arranged for communication with the interior of a refrigerated box containing said barrel or the like, a tubular construction extending through and connected to the ends of said casing and having a portion extending axially of and a portion extending substantially radially of said

casing, said tubular construction having openings in the side walls thereof defining passageways between the insides of said casing and said tubular construction, one end of said tubular construction being inserted in the barrel and the other end thereof being adapted for connection to a faucet, and a tube of smaller diameter mounted coaxially within the portion of said tubular construction lying within said casing and having its ends connected to the side walls of the tubular construction for defining a restricted fluid flow passageway.

8. A draught tube construction for connecting a source of fluid supply and a faucet comprising a tube, a restriction rod within the tube in spaced relation therefrom, an apertured hollow end closure construction for said tube having an extension pivotally connected to said rod for defining a fluid passageway from the outside of said closure construction to the inside of said tube around said rod, and filtering means in said fluid passageway.

9. A draught tube construction for connecting a source of fluid supply and a faucet comprising a tube, a restriction rod within said tube having its outer surface spaced from the side walls of the tube, a hollow cap having fluid flow openings communicating with its interior, a hollow nipple connecting said cap and said tube, an apertured extension on said nipple being pivotally connected to an end of said restriction rod, and a filtering screen around said apertured extension.

10. A direct tapping draught tube structure for drawing fluids from a barrel or the like within a refrigerated box, comprising a hollow shell having a closed end and an open end arranged in communication with the interior of the refrigerated box for circulation therebetween, a tubular construction extending through and connected to the closed and open ends of said shell, said tubular construction having a portion extending in an axial direction of said shell and a portion extending in substantially a radial direction through a side wall of said shell intermediate the ends thereof, one end of said tubular construction being inserted in the barrel and the other end thereof being adapted for connection to a faucet, and a tube of smaller diameter mounted within the portion of said tubular structure lying within the casing, said tubular construction having openings therein connecting the space between said tube and said tubular construction to the interior of said shell for circulation therebetween.

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