TAPPING DEVICE FOR BEER KEGS AND THE LIKE

ABSTRACT: The tapping device includes a keg adapter semipermanently secured within a keg opening and having liquid and gas passages. A valve having a bifurcated stem is disposed in the liquid passage whereby beer flow results. The keg adapter is secured by a ring which locks under the keg flange by cooperation with a collar which locks the keg adapter flange to the keg flange. A coupler having segregated liquid and gas passages is attached to the keg adapter when the keg is tapped.
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The present invention relates to a new, improved tapping device for drawing fluid such as beer from containers such as beer kegs or barrels, using a gas to drive the fluid from the container. In particular, the invention relates to a new, improved tapping device usable with conventional beer kegs and comprising a subunit, called a "keg adapter," which constantly seals the keg, and a subunit, called a "coupler," which is attached to the beer dispensing apparatus in a restaurant or tavern and is readily connected to the keg adapter so that the tapping device is automatically in operating condition.

Today, as in the past, the most widely prevailing practice in the beer industry is for a brewery to provide draft beer to retail outlets in "conventional" kegs which have a three-fourth inch opening in the top, closed with a bung in the form of a cork or plug. To dispense the beer from the keg, the bartender "taps" the keg by knocking in or pushing in the bung and inserting an elongated tap rod with an associated "siphon" device for drawing the beer from the keg, these being fastened to the keg by means of a "bayonet" or like connection. This siphon device includes means for injecting compressed air or CO₂ through the tap rod into the keg to drive the beer up through the siphon, and also external valve means for respectively controlling the flow of gas into the keg and the flow of beer from the keg. A gas supply hose connects the siphon to a source of gas, and another hose connects it to the beer dispensing apparatus mounted on the counter or bar in the restaurant or tavern whereby beer may be dispensed from the keg. When the beer has been withdrawn from the keg to the extent feasible, the bartender then removes the tap and siphon device from the keg, removes the keg from the dispenser cabinet, installs a new keg, and repeats the process of knocking in or pushing in the bung and installing the tap rod and related siphon equipment, etc. The same tap rod and siphon is used for every keg, and must be washed and cleaned periodically to prevent fouling and contamination.

This prevailing practice, which has been used for fifty years, has a number of disadvantages for the brewery, the dispensing establishment, and the public: The open empty kegs often become filled with debris and trash of every sort. Not infrequently mice or other objectionable things get into the keg and swell and become difficult to remove through the bung hole. Insects which get into the keg and dry on the inside wall are very difficult to wash off. Also, old yeast and other solids from the beer inevitably accumulate within the currently used conventional tap and siphon arrangements, with resultant accumulation of destructive bacteria feeding on this material. When a new keg is tapped and the gas pressure is applied, the fresh beer surges into unclean portions of the tap and siphon devices and this causes the accumulated residue of yeast, bacteria, etc., to be washed down into the keg, thus promptly contaminating the carefully brewed product and also destroying its "brewery-fresh" flavor. This problem is further aggravated by the fact that in dispensing the beer from the keg there is a tendency of the beer to surge back and forth into the tap chamber where there is much yeast and destructive bacteria have accumulated as varying gas pressure is applied when the dispensing apparatus is operated. Hence, when a keg is tapped with conventional methods, the great care in preparing pure good quality beer at the brewery promptly goes to naught at the dispensing establishment.

Further, on tapping, a substantial quantity of beer usually surges from the keg, with economic loss and a resulting mess. Then, when the bartender removes the tap rod and siphon arrangement from an empty keg, residual gas pressure in the keg will often cause the tap and siphon unit to pop out suddenly, sometimes injuring the bartender. Moreover, the beer keg is generally kept in a refrigerated unit under the bar, with limited space, as a result of which conventional tapping of the keg by the bartender is somewhat awkward, time consuming and difficult (especially if the bartender is not too strong).

In an attempt to eliminate some of these aforementioned problems, an alternative tapping device was adopted by one of the largest breweries. However, the alternative tapping device utilizes a nonconventional keg having an opening in the top with a fitting therein for receiving gas, plus another opening in the side of the keg near the bottom with a fitting therein for dispensing the beer. This arrangement requires manufacture, installation and coupling of two fittings. Also, the barrel is usually tilted to dispense the beer to maximum extent, which makes handling more difficult and requires more space.

Further, the nonconventional keg and its two fittings are not only more expensive, but also introduce problems in high speed automatic cleaning and filling of kegs if the brewery is committed to above-described conventional kegs as is usually the case. Hence, the above-described tapping arrangement is still in common use, notwithstanding its many shortcomings.

However, it should be noted that the fact that these two aforementioned tapping devices are the only ones which have had substantial commercial usage prior to this invention does not mean that others have not attempted to design and develop tapping devices that would obviate the above-mentioned problems without creating others. Numerous beer tapping devices have been proposed over the last 50—60 years. However, because of various reasons, none of these numerous proposed devices have not gained substantial acceptance in the draft beer industry. Perhaps, the principal reason why these other devices did not replace the present commercial tapping devices is because the designers of these devices did not take into account several important "facts of life" in handling draft beer.

Beer, unlike many other liquids, must be handled with extreme care lest it lose those qualities, such as taste, proper head and foam, and freedom from cloudiness, which the public demands. Thus, if the flow path from the keg to the dispensing apparatus is too tortuous or contorted or if there is too large a pressure drop across the tapping device caused by a restricted flow path, the beer will become "flat" or "wild" (e.g., too much foam).

Also, most (millions) of beer kegs or barrels in use in the United States at the present time have a three-fourth inch beer dispensing opening in their top and are designed to have the tapping unit connected to the keg by means of a bayonet-type coupling. Therefore, to gain acceptance in the market place, a new draft beer tapping device must be adapted for use with this small opening, and with the aforesaid means of attachment to the kegs. However, the problem is not merely one of miniaturization; e.g., if substantial industry penetration is to be expected, an improved tapping device must be "universal" for use with both high and low pressure draft beer dispensing systems that are used in different parts of the United States, without adversely affecting the quality of the beer.
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Still further, an improved draft beer tapping device must be rugged so as to withstand rough treatment and handling, not only during the travel to and from the breweries, but also at the dispensing establishment. In this regard, the device must not only be constructed of strong, durable nontoxic materials, but it must also be designed so that it will not project from the top of the keg, because it will commonly be knocked off the keg during handling.

However, even if an improved tapping device meets those above criteria and obviates the above-described problems, it must be subject to economical manufacture for sale at a competitive price in order to be successful.

My aforementioned U.S. Pat. No. 3,231,154 issued from my above-identified parent application Ser. No. 395,084 which discloses a new improved beer tapping device for dispensing beer or like liquids in kegs or barrels overcomes the above-discussed and other problems and shortcomings of beer dispensing systems heretofore available, and also provides a number of important advantages and improved results as hereinafter amplified. Particularly, the invention of my aforesaid U.S. Pat. No. 3,231,154 provides a new, improved means for packaging and dispensing beer and like liquids in kegs, utilizing an adapter subassembly in and sealing the keg neck with a new improved coupler subassembly which is fastened to said keg adapter by the tavern keeper or bartender, thus automatically breaking the seal and removing the keg for the dispensing of beer. Simple removal of the aforementioned coupler subassembly by the bartender causes the keg to automatically reseal, thereby positively preventing the entry of trash or other foreign objects. In addition, the beer is positively prevented from entering the gas passageway portion of the tapping device, thus preventing contamination or fouling of this portion of the device, by dried beer residue normally accumulating due to surging of the beer.

It is an object of the inventions of this application to provide further novel improved beer tapping devices, and novel improved keg adapter and coupler subassemblies, and components for the same, of the general type disclosed and claimed in my aforesaid U.S. Pat. No. 3,231,154 so as to provide additional improvements in construction, mode of operation and result, as below-mentioned.

It is another object of the present invention to provide a new improved keg tapping device incorporating a keg adapter which includes an improved bifurcated valve in the liquid passageway of the adapter for controlling the flow of beer from the keg to permit withdrawal of beer in both high and low pressure systems, without undue pressure loss or the beer becoming "wild," and also preventing leakage caused by specks of dirt or other foreign objects.

It is further object of the present invention to provide a new tapping device for dispensing liquids which includes a novel and simplified dispenser coupler unit of three-piece construction and having collar means rotating independently of the coupler unit for easy attachment of the coupler unit to a beer keg without special fittings. Moreover, in this improved coupler unit, the necessity of forming separate gas and liquid passageways in the unit is eliminated by novel cooperation between the probe and the main bore formed in the unit, whereby the bore is able to accommodate both the gas and liquid passageways while still keeping these passageways segregated.

It is still further object of the present invention to provide a new improved beer tapping device which can be used with any standard type of beer keg in common usage, even though the kegs typically vary considerably in configuration and size, according to source and time produced. Further, the keg adapter of this invention, which as mentioned above is semipermanently fastened in a beer keg, does not protrude from the end of the keg thus avoiding damage by rough handling during transit to and from breweries.

A further related object of this invention is to provide a novel and improved means for securing the aforementioned keg adapter in a conventional beer keg by cooperating with the existing keg neck structure to secure firmly the keg adapter in the beer dispensing opening of such kegs, and prevents any rotational or longitudinal movement of the keg adapter once it is in place. This novel two-piece keg adapter securing means eliminates reliance on friction fits and protects against leakage between the keg adapter and the keg; and, in addition, it can be easily installed on the kegs and, when once installed, is substantially tamperproof. Moreover, the relatively complex portion of the securing means is completely surrounded and protected by the outer portion of the securing means, thus permitting the protected portion to be molded out of plastic if desired, thereby permitting the securing means to be made inexpensively without sacrificing ruggedness.

It is still another object of the present invention to provide such a new improved means for packaging and dispensing beer or the like from a keg or like container which achieves the above discussed objects and advantages, yet can be made at a relatively low price with conventional machinery and with a minimum of tooling, whereby widespread use of the invention in its intended field is economically feasible.

It is still another object of the present invention to provide such a new improved means for packaging and dispensing beer or the like from a keg or like container which achieves the above-discussed objects and advantages, yet can be made at a relatively low price with conventional machinery and with a minimum of tooling, whereby widespread use of the invention in its intended field is economically feasible.

Still other objects and advantages of the present invention will be apparent from the following description thereof with reference to the accompanying drawings, and also the appended claims. In the drawings:

FIG. 1 is a vertical sectional view showing a new improved packaging and dispensing tapping device according to this invention, which is generally similar to the embodiment of FIGS. 3 and 5 of my aforementioned U.S. Pat. No. 3,231,154, but which includes a modified improved keg adapter unit (shown in particular detail in FIGS. 3-5), plus a modified improved dispenser coupler for use in restaurants or the like (shown in FIG. 3);

FIG. 2 is a horizontal cross-sectional view taken along line 2-2 in FIG. 1;

FIG. 3 is an exploded perspective view showing principal components of the packaging and dispensing device of FIGS. 1 and 2, it being noted that the portion of FIG. 3 within bracket A constitutes the improved coupler unit applied by the bartender, and that the portion within bracket B constitutes the improved keg adapter unit installed in the keg at the brewery (certain components of the keg adapter unit being unexplained but shown in FIG. 4);

FIG. 4 is an enlarged perspective exploded view showing the valve and related components of the keg adapter unit;

FIG. 5 is a perspective sectional view of the main portion of the keg adapter unit showing in particular the air passages formed by cutting away threaded portions;

FIG. 5A is a top plan view of the main portion of the keg adapter unit shown in FIGS. 4 and 5;

FIG. 5B is a vertical sectional view of the main portion of the keg adapter unit taken along lines 5B;

FIG. 6 is an exploded perspective view comprising subfigures 6A, 6B, 6C, 6D and 6E showing the new improved arrangement of the present invention for securing the keg adapter to a conventional collar of a beer keg; and

FIG. 7 is a vertical sectional view of the upper portion of the improved dispenser coupler unit shown in FIG. 1 with a conventional dispenser cap secured thereto.

All drawings and the entire specification of my aforementioned U.S. Pat. No. 3,231,154, and of my said parent application from which that patent issued, are incorporated herein by reference as though here fully set forth.

FIGS. 1-5B, 6 and 7 reveal several embodiments of the present invention constituting improvements on the beer tapping devices and components thereof disclosed and claimed in my aforementioned U.S. Pat. No. 3,231,154. FIGS.
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1. A new improved keg tapping and dispensing device, A-B, including an improved simplified dispenser coupler unit A3 for use with the conventional dispensing apparatus and tanks of compressed gas that are usually found in taverns and restaurants (per FIG. 1 of my aforementioned U.S. Pat. No. 3,231,154), plus an improved keg adapter unit B3 having an enlarged liquid passageway and an improved gas passage and check valve arrangement.

For clarity and to minimize duplication of description, parts of the embodiment of FIGS. 1—5B which are the same as those in the various embodiments of FIGS. 1—8 of my aforementioned U.S. Pat. No. 3,231,154 are identified by like numerals as in the drawings and disclosure of said U.S. Pat. No. 3,231,154 incorporated herein by reference; and modified parts which correspond to parts of various embodiments of FIGS. 1—8 of my aforementioned U.S. Pat. No. 3,231,154 are identified in FIGS. 1—5B by like numeral plus the subscript d, to the extent that is feasible.

Referring now to FIGS. 1—5B the improved dispenser coupler unit A3, while somewhat similar to the coupler units shown in FIGS. 2, 3, 5 and 7 of my aforementioned U.S. Pat. No. 3,231,154, has a novel, compact, efficient construction which greatly simplifies manufacturing, cleaning and maintenance as compared with commonly used prior art conventional tapping units, and even as compared to my novel advantageous dispenser coupler units exemplified by embodiments A and A2 in FIGS. 5—6 and FIGS. 7—7A of my aforementioned U.S. Pat. No. 3,231,154.

The improved coupler unit A3 includes a generally cylindrical head 44d which has a vertically extending bored hole 136 of three diameters, indicated at 138, 140 and 152. A tubular arm 144, having a central bore 146, is preferably formed integrally with the head 44d and is adapted to receive the end of a piece of tubing that connects coupler unit A3 to a tank of pressurized gas or air, such as the tank 30 shown in FIG. 1 of my aforementioned U.S. Pat. No. 3,231,154. The coupler unit A3 also includes a generally tubular probe 64d which is positioned within the bore 136 and which has a central bore 66d that forms the sole liquid passageway through the coupler unit. The exterior of the probe 64d is provided with grooves 137 and 139 for sealing rings 141 and 143, which may be "O"-rings of neoprene rubber. The sealing rings 141 preclude the escape of gas from passageway 64d formed by bores 146, 138 and 142; and the unique cooperation between head 44d, probe 64d, seals 141 and 143, eliminates the necessity of drilling a separate gas passageway in the head 44d with resultant savings in manufacturing costs and easier cleaning and maintenance.

The upper end of the probe 64d has an outwardly extending flange 148 having an outer diameter and thickness substantially equal to the inner diameter and depth of bore 136 whereby when the probe is positioned within the head 44d the upper end of the probe 148 is aligned with the top of the head as shown in FIG. 1. Referring to FIG. 7, when dispenser coupler unit A3 is used in a restaurant, a conventional cap 152 is connected to the externally threaded portion 150 of head 44d, and this cap 152, used with a sealing ring 154, holds the probe 64d within bore 136 in coupler head 44d, thereby forcing the lower end of the probe 64d to project sufficiently below the bottom of the coupler head portion 44d so as to open the beer valve in the keg adapter unit B3 when the coupler unit A3 is connected thereto, in a manner similar to that described with regard to the embodiments of FIGS. 2, 3, 5 and 7 of my said U.S. Pat. No. 3,231,154 (and as hereinafter amplified). Cap 152 has two handle portions 156 and its upper end 158 is adapted to be connected to the beer conduit of conventional dispensing apparatus typically used in taverns, restaurants, and the like (such as shown at 36, 38, 40 and 42 in FIG. 1 of my said U.S. Pat. No. 3,231,154).

An annular member 160 is secured about the slightly enlarged lower end of the coupler head portion 44d by a snap ring 162 and retains collar 118d rotatably mounted on coupler head 44d. The snap ring 162 allows the member 160 to be quickly removed from the head 44d so that collar 118d can be slipped off head 44d for easy repair or replacement when necessary. The collar 118d has a plurality of handle portions 119d formed integrally therewith, is internally threaded at 120d for cooperation with the threaded portion 128d of the annular ring 126d, as shown in FIG. 1, and fits loosely on the head thereby permitting relative rotation between the collar and the head. The ring 126c forms the outer portion of the above-mentioned improved means (shown particularly in FIGS. 6B, C and D) for securing the keg adapter unit B3 in the standard three-fourth inch diameter opening 22 in a conventional beer keg 20, as more fully described hereinafter. The bottom of the head 44d carries an annular seal 56d which may be of an "O"-ring of neoprene rubber, for providing an annular seal between the coupler unit A3 and the upper surface 166 of the ring 126d of adapter unit B3 surrounding the beer and gas passages (see FIG. 1). While the keg adapter unit B3 shown in FIGS. 1 and 3 is somewhat similar to the keg adapter units shown in FIGS. 2 and 7 of my said U.S. Pat. No. 3,231,154, the keg adapter unit B3 has a unique gas passageway formed therein permitting an enlarged beer withdrawal passage, with an improved beer check valve arrangement providing a number of important advantages, as exemplified herein.

Thus, the keg adapter unit B3 comprises a main fitting 76d which includes a generally cylindrical body section 77d having an enlarged flange 78d extending radially outwardly from the upper end thereof. The outer periphery of the flange 78d is notched, as shown at 168, and cooperates with a reversed notched portion 170 formed about the edge of the central aperture 172 in the ring 126d to prevent the fitting 76d from passing upward through the ring aperture 172. These notched portions of the flange 78d and ring 126d are arranged so that when the keg adapter unit B3 is positioned in a keg, the upper surface of the flange 78d lies in the same horizontal plane as the upper surface 160 of ring 126d, as shown in FIG. 1, whereby metal ring 126d protects the adapter fitting 76d, particularly when the latter is made of plastic.

The body section 77d of main fitting 76d has a pair of centrally disposed, coaxial bores 82d and 84d formed therein. As shown in FIGS. 5, 5A and 5B, there are four longitudinally extending segments 174 positioned evenly about the inner periphery of these two bores and defining between them four substantially identical upper slots or grooves 176 and lower slots or grooves 177. The segments 174 in the lower bore 84d protrude longitudinally, slightly above the shoulder 178 formed between the two bores 82d and 84d thereby forming four radial grooves 180 in the shoulder 178 that interconnect the slots 176 and 177 in the two bores 82d and 84d. The upper portions of the segments 174 in the upper bore 82d are provided with interrupted threads 182 adapted to receive an externally threaded retainer ring 92d, the lower end of which tightly engages annular rubber valve seat 88d to secure valve seat 88d between the ring 92d and the upper end of a tubular member 184. Member 184 includes an upper portion 185 which fits within the bore 82d and a lower portion 187 which fits within the lower bore 84d and extends beyond the lower end of the main fitting 76d. A compression spring 97 fits within the upper portion of the member 184 and its lower end rests on the shoulder 189 formed by the juncture of the two portions 185 and 187 of member 184. The spring 97 biases a new improved form of beer valve 90d upwardly against the underside of the rubber valve seat 88d in a manner like that described above in connection with the embodiments of FIGS. 1—8 of said U.S. Pat. No. 3,231,154. The improved valve 90d differs from valve 90 shown in FIG. 8 of said U.S. Pat. No. 3,231,154 in that the middle part of the stem portion 98d has been removed as shown in FIG. 1, 10 and 12, so as to enlarge the beer passage space 99d when the valve 90d is displaced from seat 88 by application of the coupler (as in FIG. 1). This provides superior beer flow characteristics making the keg adapter unit B3 universal for low- and high-pressure beer systems, while avoiding making the beer "wild" as it is drawn from the keg.
Referring again especially to FIG. 1, a beer tap rod 106d is frictionally or otherwise secured around the lower end 187 of member 184, and extends to the bottom of the keg (similarly to FIG. 1 in my aforesaid U.S. Pat. No. 3,231,154). Tap rod 106d may be made of a suitable flexible material, in which case it need not be bent like metal rod 106C in FIG. 1 of my said U.S. Pat. No. 3,231,154 to permit insertion of a rod through side opening 29 of typical beer keg 20.

A resilient gas check valve 108d is positioned with a lower portion tightly engaging a peripheral portion of tap rod 106d, and the lower end of the keg adapter body section 77d is chamfered at 186 to receive the upper end of the gas check valve 108d which tightly fits around part 186. Like in valve 108 shown in FIGS. 2, 3 and 7 of my aforesaid U.S. Pat. No. 3,231,154, a slit 109 is formed in the intermediate portion of valve 108d to permit gas or air to pass from the inside of the valve to the interior of the keg when the pressure of the gas is greater than the pressure inside the keg; whereas the ends of valve 108d and slit 109 prevent gas or beer from passing from the interior of the keg to the inside of valve 108d and thus preclude contamination of the gas feed portions of the tapping device comprising keg adapter B8 and coupler dispenser A8.

The improved keg adapter unit B8 of this invention including main fitting 76d achieves an increased gas passageway through which gas or air under pressure may pass from dispenser coupler coupling A8 to the interior of valve 108d, via grooves 176 and 177 and radial grooves 180 perforated in the interrupted threads 182 of body section 77d in cooperation with ring 92d, valve seat 88 and member 184. The outwardly extending flange 186 on the upper end of the ring 92d protects the upper end of this passageway from the entry of dirt, etc. without causing undue restriction of the gas passageway. Thus, the improved gas passageway in the adapter unit B8 is formed through the unique utilization of existing structures of the fitting 76d and obviates the necessity of drilling an extra, separate bore for the gas passageway in the adapter unit (as in the embodiments of FIGS. 1—B of my said U.S. Pat. No. 3,231,154). This not only leads to savings in the manufacturing costs; but, more importantly, given the maximum limit of a three-fourth inch beer keg passage, it makes it possible to provide a larger beer passage in the keg adapter main fitting 76d to reduce pressure drop and enable use in both high- and low-pressure systems. Moreover, use of this feature in conjunction with the beer valve 98d having a cutout stem 98d in main fitting 76d has provided an unexpectedly improved keg adapter unit B8.

The keg adapter B8 having the described arcuate slotted gas passages extending around the beer valve, as shown particularly in FIGS. 1—B, has a relatively small radial dimension but relatively large annular dimension, thus providing a quite large cross-sectional area within the overall total three-fourth inch diameter size limit imposed on a tapping device for conventional “Peerless” type beer kegs, which are the most numerous in use in the U.S. beer industry. A gas passage arrangement such as that shown at 87 in FIGS. 2, 3 and 7 of my aforementioned U.S. Pat. No. 3,231,154 is fully satisfactory for a single beer keg installation, which is typical of most U.S. draft beer dispensing installations. However, said gas passage arrangement is not fully suitable for certain types of “Series Taps,” wherein a plurality (e.g., four) draft beer kegs are connected in series, according to marketing practices in some parts of the United States. In such “Series Tap” installations, the beer must be driven from the most remote keg in the series through all the intermediate kegs to the first keg connected to the dispensing faucet, via the gas valve passages in the tapping devices. The disclosed and described novel arrangement of arcuate elongated gas passages having a large cross-sectional area, with minimal radial dimension makes it possible to provide the new improved embodiment of FIGS. 1—5 in series tap draft beer systems. This affords important competitive advantages, since a single model draft beer tapping device according to this invention can be used for both single beer kegs and multiple keg series tap installations. Among other things, this new improvement simplifies production, inventory, marketing, achieving increased trade acceptance, as well as reducing costs, etc.

It is noted, however, that the above-described arrangement shown in FIGS. 1—B5, is a preferred form of the improved gas passageway per this invention, but that it would be possible to form grooves like 176 and 177 on the exterior of ring 92d and in member 184 rather than in the interior of body section 77d of the fitting 76d.

As hereinafter mentioned, the keg adapter unit B8 of FIGS. 1—5 is held in the standard opening 22 in a conventional beer keg 20 by means of a novel and improved securing means shown particularly in FIG. 6, as well as FIGS. 1—3, adapted to cooperate with the so-called “Peerless” beer keg flange or collar 23 found on conventional beer kegs in most common use. This improved securing means includes the ring 126d which, as shown in FIG. 1, has its lower end spaced slightly above the top of the keg 20, and which is internally threaded at 190 to receive an externally threaded ring 192, as shown in FIG. 6D. The ring 192 includes a thin wall section 194 which has inwardly and upwardly projecting, diametrically opposite tabs 196 and 198 formed on its inner periphery. Also formed on the inner wall of the wall section 194 and spaced circumferentially from the tabs 196 and 198 are inwardly extending, diametrically opposite abutments 200 and 202. As shown more clearly in FIG. 6E, the standard “Peerless” beer keg flange 23 has two diametrically opposite cutaway portions 204d and 204e, and at one end of each of these cutaway portions, there has a lower depending projection 208d formed integrally with the flange 23 and the short, cylindrical wall 22 of the opening 22. These two projections 208d have an outer diameter equal to the outer diameter of the flange 23 and the lower end of each is spaced above the top of the keg 20, a distance slightly greater than the height of the wall section 194 of ring 192.

To utilize this improved securing means, the ring 192 is snapped over the flange 23 so that it rests on the top of keg 20 with the tabs 196 and 198 extending upwardly; and the ring 192 is aligned so that the projections 208 of the flange 23 fit between adjacent tabs 196 and 198 and abutments 200 and 202. The keg adapter unit is checked to be sure that main fitting portion 76d is properly positioned within the keg opening 22 and that a sealing ring 116 is correctly positioned between the top of the keg flange 23 and the bottom of adapter fitting flange 76d. The ring 126d is then placed over the upper end of the adapter fitting portion 76d and aligned with the flange 76d so that the respective notched portions 168 and 170 of each will properly fit together. Thereafter, the ring 126d is threaded on ring 192 so that the ring 192 is drawn up within the lower inside portion of ring 126d until the upper ends of the tabs 196 and 198 contact the underside 23 of keg flange 23 (FIGS. 1 and 6). The height of the wall section 194 is such that when the ends of the tabs 196 and 198 contact the underside 23 of keg flange 23, the entire wall section 194 is completely within and protected by the ring 126d. Thus, as shown in FIGS. 1 and 2, when the rings 126d and 192 are assembled, they cooperate with the flange 23 to securely lock the keg adapter unit within the opening 22 to prevent any longitudinal or rotational movement of the adapter unit relative to opening. Moreover, due to the unique construction of this arrangement for securing a keg adapter unit B8 and its main portion 76d in a keg, the relatively complex portion of the securing means, namely, ring 192, may be inexpensively molded of plastic, without sacrificing strength or ruggedness of the keg adapter B8, which in turn endorses considerable abuse in draft beer commercial operations, since the metal ring 126d completely protects plastic securing ring 192 as well as adapter main unit 76d.

Thus, it is readily apparent that the improved securing means of this invention provides a simple and inexpensive, yet sure way of locking the keg adapter units of this invention in the standard three-fourth inch diameter openings of the conventional beer kegs without requiring any modification of the openings or flanges of the kegs.
Summarizing the mode of operation of the unit of FIGS. 1—5, the keg adapter unit B3 is installed in the keg 20 at the brewery as above explained. The valve body 90d is normally biased closed against seat 88d by spring 97, thus sealing the keg 20, preventing loss of beer or ingress of foreign objects, etc., as discussed above. To tap a keg full of beer, the bartender applies to the adapter unit B3, the coupler unit A1 having a cap 152 connected to the beer outlet conduit, with gas inlet 144 connected to a gas supply. This is done by merely inserting coupling probe 64d in the aperture of ring 92d and rotating coupler collar 118d to thread it on adapter unit collar 126d. The "O-rings" 143, 141 and 56d seal off the gas passage 146—140—176—170—177 to the inside of gas check valve 108d. The probe 64d depresses the split valve stem 98d to open the beer dispensing passage through 106d—187—185—85d—66d, while "O-rings" 141 and 143 and slit valve 108d prevent beer from spurring into any part of the passageways in either the keg adapter B3 or the coupler unit A1. Removal of coupler unit A1, by unthreading collar 118d automatically reseals the keg adapter B3, and thus the keg 20.

Operation of the above-described new improved tapping devices of the present invention will now be summarized with particular reference to FIGS. 1—6.E.

The keg adapter B3 is installed in keg 20 ("Peerless" type), shown in FIG. 1 of my said U.S. Pat. No. 3,321,154, by inserting the main fitting 76d and tap rod 106d extending therefrom through the aperture 22 of keg 20, and then securing this adapter B3 to keg 20 by applying the keg adapter inner locking ring 192 and outer keg locknut 126d as above described with particular reference to FIG. 6. Keg adapter B3 can be washed and sterilized in place in the keg, while the latter is being sterilized, either on automatic equipment or by hand, using means to shoot cleaning solution and then hot water or steam through keg adapter B3. The keg 20 is filled with beer by means of a filling rod inserted through a side aperture (see FIG. 1 of my aforementioned U.S. Pat. No. 3,321,154). Unless and until the coupler unit A1 is installed at the tap, the pressure of spring 97 on the underside of the valve closure member 90J forces the latter to engage the rubber sealing ring 88d, thus sealing keg opening 22 to prevent either gas or beer from escaping. When the keg 20, incorporating the keg adapter B3 is installed in the beer dispensary, the bartender assembles the coupler A3 on the keg adapter B3, by the simple expedient of screwing the wingnut 118d of coupler head 44d onto the threaded exterior 128d of keg adapter outer locknut 126d, until the O-ring 56d is sufficient to compress good into seaming engagement with the outer surface of flange 78d of the main fitting 76d of keg adapter B3. Meanwhile, the end or tip of coupler unit probe 64d is inserted within the axial bore of sealing ring 92d, with probe O-ring 143 sealingly engaging the same, whereby the lower end or tip of probe 64d depresses the vertical sides of bifurcated stem portion 92d of the valve 90d, thereby displacing the sealing plate of beer valve 90d from the underside of rubber seating gasket or ring 88d, as shown in FIG. 1. This allows beer to flow into the interior of valve spring retaining section 184 via tap rod 106 from keg 20 and to pass through the central aperture of valve sealing ring 88d and bifurcated valve stem 98d into the central bore of coupler probe 64d and thence through a dispensing hose secured to conventional cap 152 on coupler head 44d (see FIG. 3A) to a dispenser faucet (e.g., see 38 and 40 in FIG. 1 of my said patent No. 3,321,154). Since the O-ring 143 is in sealing engagement with the inside of retainer ring 92d, beer is prevented from escaping to the outside of coupler probe 64d. The faucet at the dispenser is used to control withdrawal of beer from keg 20 in known manner. When the keg 20 is first tapped, the tip of coupler probe 64d is depressed to the typical loss of a quart with prior conventional tapping means. An air supply fitting is secured to extension 144 of coupler head 44d of unit A3, and compressed air or gas is supplied at a controlled rate to the tapping assembly A3—B3. Since the lower surface of head 44d of coupler unit A3 is sealed tightly against the upper surface of flange 78d of adapter unit B3, and since the probe 64d is also sealed with respect to keg adapter B3 by O-ring 143, the gas or air feed into aperture 146 of extension 144 is forced down through passages 136 and 142 through the air grooves 176 in keg adapter B3 into the interior of slit gas valve 108d. The compressed gas or air passes out through slit(s) 109 of gas valve 108d but cannot pass back through gas valve 108d or into the liquid valve chamber through which beer is passed via tap rod 106d. When the pressure in the keg 20 is less than the gas pressure fed to the tapping assembly A3—B3, the rubber valve 108d expands, thereby releasing gas into the keg through the valve slit(s) 109, and the gas thus injected into the keg 20 forces the beer through the tap rod 106d, and up through tubular tap rod 106d directly into the keg valve chamber, whence it passes through central aperture 65d of coupler unit A3 to the dispensing line, as previously discussed.

In recapitulation, it is apparent from the foregoing that the present invention provides a new improved gas pressure tapping device for drawing fluids such as beer from containers such as beer kegs; said tapping device utilizing a new improved keg adapter unit which remains in the beer at all times keeping it sealed and a new improved dispenser coupler unit which is semipermanently connected to the conventional dispensing apparatus at a tavern or restaurant and which can be readily and easily connected to the keg adapter unit by a bartender. While keeping within the three-inch outer diameter limitation dictated by the size of beer openings in conventional beer kegs, the improved keg adapter units of this invention have a relatively large, non-tortuous and unobstructed liquid passage through which the beer is withdrawn from the keg with a minimum of expansion and contraction, thereby substantially obviating the problem of beer becoming "wild" or "flat" during withdrawal, and making this invention universally usable with low and high pressure beer systems. Moreover, the improved keg adapter units of this invention also include a gas passage which is completely segregated from the liquid passage therein, and with the beer being positively prevented from entering any part of the gas passage from within the keg, thus preventing contamination of the beer. In addition, the keg adapter units include new improved means for securing said adapter units within the beer openings in conventional beer kegs (e.g. so-called "Peerless" system kegs) without modification of openings in these beer kegs. The new improved coupler units of this invention can be easily and quickly attached to the keg adapter units and permit the tapping of beer kegs without the mess and economic loss heretofore common in tapping beer kegs using the prior tapping devices. The arrangement of the dispenser coupler units of this invention is such that it can be easily maintained and cleaned and can be manufactured competitively. Thus, the new, improved tapping device of this invention, with all its herein-disclosed novel and improved features, clearly achieves the various important objects and advantages set forth above.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are theretofore intended to be embraced therein.

What I claim and desire to be secured by United States Letters Patent is:

1. A liquid dispensing apparatus adapted for use with a keg or like container for liquid which has top, bottom and sidewalls with an opening in one wall of said keg surrounded by a keg neck and an outwardly directed flange about the terminus of said keg neck and spaced from said one keg wall.
characterized in that it comprises: a keg adapter including a generally cylindrical main body, means for securing said body within the keg wall opening including an annular portion for overlying keg neck, said securing means further including an element engageable with and below the flange about the keg opening, said keg adapter having a liquid passage extending therethrough for transfer of liquid from the inside to the outside of a keg, said liquid passage being defined in part by a central annular portion carried by said main body; normally closed liquid valve means in the liquid passage through said adapter, said main body including a sleeve defining with said central portion an annular gas passage therebetween and bypassing said liquid passage and said liquid valve means for transmitting gas through said adapter from the outside to the inside of the keg, means extending between said sleeve and said central portion interrupting a portion of said annular gas passage and forming a plurality of slots, and normally closed gas valve means carried by said adapter and associated with said gas passage for permitting in a valve open position, flow of gas toward the inside of the keg and for preventing in a valve closed position, flow of liquid from the keg through said gas passage.

2. Apparatus according to claim 1 including a dispensing coupler unit for releasable connection with said keg adapter comprising a coupler head having a member disposed therein forming a liquid passage through said coupler unit, one end of said member projecting from said coupler head for communication with the liquid passage in said annular portion of said keg adapter when said coupler unit is connected to said keg adapter, said coupler head having a gas passage for communication with the gas passage in said keg adapter when said coupler unit is connected to said keg adapter, said liquid passage and said gas passage in said coupler unit being segregated one from the other, and means adapted to releasably connect said dispensing unit to said keg adapter, said means including a collar carried by said coupler unit and freely rotatable about said head, means for retaining said collar on said coupler head including a ring removably attached to said coupler head, means carried by said collar and engageable with said first mentioned annular portion for releasably coupling said dispensing unit to said keg adapter.

3. Apparatus according to claim 2 including sealing means about the end of said member projecting from said head for sealing engagement about the annular portion of the main body.

4. Apparatus according to claim 1 wherein said gas valve means includes a flexible member.

5. Apparatus according to claim 1 wherein said central portion includes a substantially annular shoulder and a valve seat, said liquid valve means including a valve stem and a spring seating on said annular shoulder and urging said valve stem toward said seat to maintain said liquid valve means in a normally closed position.

6. Apparatus according to claim 5 including a siphon tube extending from the lower end of said adapter body in communication with the liquid passage therethrough.

7. Apparatus according to claim 1 wherein said first mentioned annular portion comprises a substantially radially outwardly directed flange, and a sealing ring between said flange and the marginal portions of the keg neck about the opening.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,591,058
Dated July 6, 1971

Inventor(s) Mack S. Johnston

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Abstract, line 4, after "whereby" insert -- non-tortuous --. Column 6, line 61, "and" should read -- end --; line 69, "Fig. 1, 10 and 12" should read -- Figs, 1, 10 and 12 --. Column 11, line 4, after "overlying" insert -- the --; line 6, "opening" should read -- neck --.

Signed and sealed this 8th day of May 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents
Disclaimer


Hereby disclaims the portion of the term of the patent subsequent to Jan. 25, 1983.

[Official Gazette November 14, 1972.]