TAPPING ASSEMBLY FOR BEER KEGS AND THE LIKE

Inventor: Mack S. Johnston, 26 Hitching Post Dr., Rolling Hills, Calif.

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UNITED STATES PATENTS
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3,495,620 2/1970 Raimondi et al. 251/65 X
729,145 5/1903 Eckenwiler 137/212
3,376,013 4/1968 Mallett 251/65 X
3,360,007 12/1967 Haidek et al. 251/65 X

Tapping assembly for beer kegs and the like with gas and liquid passageways containing normally closed valves, which when opened permit compressed gas to be admitted to the keg and beer to be withdrawn therefrom, said valves being biased toward the closed position by actuators which contain permanent magnets. A tapper is connected to a source of compressed gas and to a beer faucet and contains a tap rod, which, when manually actuated, seals the tapper to the adapter and interconnects the gas source and the faucet with the interior of the keg.

19 Claims, 10 Drawing Figures
TAPPING ASSEMBLY FOR BEER KEGS AND THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates generally to the siphoning art, and more particularly to a novel tapping assembly for beer kegs and the like, for drawing liquids such as beer from barrels or kegs, utilizing a gas such as air or carbon dioxide as the pressure force.

For many years, the prevailing draft system for dispensing beer from kegs required a wooden bung or cork which sealed an opening in one end of the keg, which bung was removed by the bartender who then inserted into the opening an elongated tap rod assembly which had a siphoning device associated therewith. Means were provided to inject compressed air or carbon dioxide into the keg through the tap rod assembly, whereby the beer was driven out of the keg through the siphoning device to a spigot or faucet which controlled the flow of beer from the keg.

After all of the available beer had been withdrawn from the keg, the bartender would then remove the tap rod assembly and siphoning device from the spent keg and repeat the process with a full keg. Inasmuch as the same tap rod assembly and siphoning device were used over and over again, it was necessary for the bartender to frequently clean the unit in an effort to remove old yeast deposits and bacteria so as to avoid contaminating the beer in the fresh barrel.

Another problem with the aforementioned draft system was that the spent or empty keg had an opening in the end thereof from which the bung had been removed, which opening permitted all kinds of foreign matter and things to enter the keg. Consequently, the cleaning of these kegs at the brewery prior to refilling was a laborious and costly process.

Being familiar with the aforementioned problems, I invented various beer tapping assemblies which included a keg adapter mounted in the keg and including a spring-biased valve which remained closed to prevent the escape of beer until a tapper was engaged with the adapter and actuated to cause a probe to unseat the aforementioned valve and permit the beer to flow therefrom under pressure from a source of compressed air or carbon dioxide which was connected to the tap. Various forms of my aforementioned adapter and tapper assembly are described in U.S. Pat. Nos. 3,231,154, issued Jan. 25, 1966, 3,253,724, issued Nov. 21, 1967, 3,410,458 issued Nov. 12, 1968, 3,435,997, issued Apr. 1, 1969, 3,497,114, issued Feb. 24, 1970, 3,563,424, issued Feb. 16, 1971, and 3,567,080, issued Mar. 2, 1971.

Although the various forms of keg adapters and tapper shown and described in the aforementioned patents constituted a considerable improvement over prior beer tapping devices, they were not completely satisfactory, primarily because of the problems encountered with properly washing all of the various parts and passageways contained in the keg adapter, including the various coiled springs which maintained valves and parts in closed and engaged positions.

Another problem was that the force of the water used in washing the kegs with the keg adapter in position, was usually not strong enough to compress the main coil spring which held the beer valve in the closed position, and therefore it was necessary to employ a fixture with fingers which engaged and opened the various valves against the action of the biasing springs.

Yet another problem was that the coiled spring which was used for maintaining the main valve in a closed position prior to tapping, tended to become "set" in the compressed or valve-open position, whereby in subsequent installations it failed to effectively close the main valve while the keg was being transported, with the resultant loss of beer and internal gas pressure.

A further problem with existing equipment, is that it is often difficult for a woman bartender to properly engage the tapper with the keg adapter, and subsequently actuate the probe as to tap the keg.

SUMMARY OF THE INVENTION

With the aforementioned limitations and deficiencies of prior tapping equipment in mind, and the problems which have been encountered with my own improvements as referred to above, it is an object of the present invention to provide a novel keg adapter for beer kegs and the like which contains relatively few parts, whereby appreciably facilitating the washing thereof. More particularly, it is an object to provide a keg adapter with relatively few parts and in which such parts are of a simple configuration, and which contains relatively unobstructed beer and gas passageways, whereby the adapter can be properly cleaned while attached to the keg and with a minimum of time and effort.

Another object is to provide a novel keg adapter which is completely devoid of spring biased valves, whereby obviating the aforementioned problems of "set" and washing difficulties. More particularly, it is an object to provide in such an adapter, valves which are biased toward the closed position by a force or pressure source which remains substantially constant regardless of the number of times the adapter is used and reused. Specifically, it is an object of the present invention to employ valve actuators containing permanent magnets, which actuators are of stream-lined configuration.

A further object is to provide a novel keg adapter in which the various beer and gas valves are effectively maintained in the closed position during shipping and prior to tapping, but which are easily opened by a stream of water during the cleaning operation and while the adapter is mounted in an empty keg.

Yet another object is to provide a novel tapper for use with the aforementioned keg adapter, which is simple in construction and easy to operate, whereby even the most inexperienced bartender can easily and quickly tap a keg of beer, using a minimum amount of physical force. More particularly, it is an object to provide such a novel tapper which can be installed by a simple push and twist operation, and which is held in sealing engagement with the adapter by performing the tapping operation.

An additional object is to provide a novel tapper which prevents beer from flowing in the reverse direction from the faucet or spigot toward and out of the tapper, as when the tapper is disengaged from the keg adapter. More particularly, it is an object to provide such a tapper with valve means which automatically close prior to the disengagement of the tapper from the adapter, whereby beer is prevented from flowing in the reverse direction from the faucet toward and out of the tapper.
Yet another object is to provide a novel tapper which requires the tap rod to be disengaged and the gas flow into the keg cut off, before the tapper can be disengaged from the keg adapter.

I have discovered that the foregoing objects and advantages are achieved by a tapper assembly which comprises a keg adapter and a tapper, the keg adapter including a housing of magnetic material adapted to be mounted in an opening in a keg and containing gas and liquid passageways provided with valves yieldably biased toward the closed position by actuators which contain permanent magnets. The magnetic actuators maintain the valves in the closed position during the filling of the keg and during shipment but are easily moved to the open position by a stream of water under pressure entering the passageways, as when the keg is being washed prior to refilling. The tapper is adapted to be connected to a source of compressed gas and to a faucet for dispensing the beer, and contains gas and liquid passageways in communication therewith, said passageways being provided with valves for controlling the flow of gas and liquid therethrough. The tapper is adapted to be engaged with the keg adapter and contains a tap rod, which, when manually actuated, seals the tapper to the adapter, opens the valves in the tapper, and opens the liquid valve in the adapter, whereby gas can flow into the keg and beer can be dispensed from the faucet.

**BRIEF DESCRIPTION OF THE DRAWINGS**

In the drawings:

FIG. 1 is a schematic drawing of a tapping assembly embodying the teachings of the present invention, shown installed in a keg of conventional construction and interconnected with a conventional source of gas pressure and with a conventional faucet or spigot;

FIG. 2 is a vertical, sectional view of the tapping assembly shown installed in a keg, the assembly being in the closed or unengaged position;

FIG. 3 is a fragmentary, elevational view of the upper portion of the tapper, viewed generally from the left of FIG. 2 and shown partially in cross-section to illustrate the construction of the gas passageways;

FIG. 4 is an enlarged, horizontal, sectional view of the actuator for the tap rod assembly, taken generally on the line 4—4 in FIG. 2;

FIG. 5 is a vertical, sectional view of the tapping assembly, similar to the view shown in FIG. 2, but with the assembly in the open or engaged position;

FIG. 6 is a top, plan view of the tapper, with the handle thereof in the closed or unengaged position;

FIG. 7 is an elevational view of the upper portion of the tapper, taken on the line 7—7 in FIG. 6;

FIG. 8 is a perspective view of the beer flow-controlling valve, removed from the assembly shown in FIG. 5;

FIG. 9 is a horizontal, sectional view of the adapter taken on the line 9—9 in FIG. 5; and

FIG. 10 is an enlarged, fragmentary, vertical, sectional view of a portion of the keg adapter, showing an alternative form of gas flow-controlling valve and valve actuator.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Although the tapping assembly of the present invention can be used for siphoning various liquids from containers, it is especially suitable for use in the dispensing of draft beer, and will be so described. It is also to be understood that various types of gas pressure sources and faucets can be employed and that the keg and gas cylinder can be located under the counter in a tavern or bar, or in the basement or storage room of a restaurant.

Referring to the drawings more particularly by reference numerals, and specifically to FIG. 1, the number 12 indicates generally a tapping assembly constructed in accordance with the teachings of the present invention, shown installed in a beer keg 13 of conventional construction having a filling opening 14 closed by a bung 15, and interconnected with a cylinder of compressed air or carbon dioxide 16 by a gas hose 18, and with a faucet or spigot 20 by means of a beer hose 21.

The tapping assembly 12 (FIG. 2) includes a tapper 22 which is engageable with a keg adapter 24, the latter being mounted in an opening 26 contained in the end wall 28 of the keg 14.

The keg opening 26 contains an inwardly extending bottom flange portion 30 which provides a ledge 32, and is surrounded by an upwardly extending flange portion 34 which contains internal threads 36.

The keg adapter 24 (FIG. 2) includes a cylindrical adapter housing 38 made from a magnetic material such as stainless steel, with an outwardly extending upper flange portion 40 which bears upon an O-ring 42 supported on the aforementioned ledge 32.

The adapter is held in position by a conventional retaining ring 43 which engages the upper face of the flange portion 40 and which contains an internal annular groove 45 with opposed slots 47.

The upper end of the adapter housing contains an annular groove having a bottom wall 44 and an outer side wall 46, the latter being provided with a shoulder 48.

Extending downwardly from the bottom wall 44 of the groove and through the housing, are two diametrically opposed gas passageways 50, each having a lower inner wall 51 and having a valve seat 52 in the upper portion thereof. Positioned in each of the gas passageways in a gas valve 54, which, in the preferred form, comprises a separate valve member 56 made from a tasteless and odorless resilient material such as Neoprene, and which is adapted to engage the valve seat 52, and a valve actuator 58 formed from a permanent magnet 60 enclosed within a smooth casing 62 which is in sliding engagement with the lower wall 51 of the gas passageway. I have achieved excellent results with both magnesia and plastic cases, and cases made of stainless steel are also acceptable if the metal is very thin so as not to add too much weight to the actuator. In short, it is desirable to have the valve actuator as light in weight as possible. The upper end of the casing may be closed with a Teflon insert which holds the magnet firmly in position and without causing any binding in the gas passageway.

It will be noted that the center of each magnet 60 is off-set in a downward direction from the center of the "mass" of the metal adapter housing 38, which causes each magnet to endeavor to move within the gas passageway 50 toward the center of the housing, where there is less magnetic reluctance and the lines of electro-magnetic force have the shortest paths to travel through the housing 38, which, as previously mentioned, is made from a magnetic material such as stain-
less steel. This causes each valve actuator 58 to bias its associated valve member 56 to the closed position, in engagement with the valve seat 52.

Diametrically opposed gas vents 64 are provided in the upper portion of the adapter housing in communication with the gas passageways 50 and adjacent to the valves 56, whereby gas can flow past the valve members 56 when they are in the open position, and into the interior of the keg 14, as will be described more fully hereinafter.

Projecting upwardly from the center of the adapter housing 38 is a tubular bayonet portion 66 which includes an outer wall 68 provided with an external annular groove which receives an O-ring 70.

The center of the tubular bayonet portion provides a beer passageway 72 which contains a valve seat 74 (FIG. 2) and a lower inner wall 76, said passageway being in communication at the lower end thereof with a siphon tube 78 of conventional construction, said tube being removable from the lower end of the adapter housing 38 by a threaded fitting. As shown in FIG. 1, the siphon tube 78 extends to a shoulder 98 on the bottom wall of the keg 14, in a conventional manner.

Slidably mounted within the beer passageway 72 is a valve assembly which includes a valve member 80, preferably made from a tasteless and odorless resilient material such as Neoprene, and a valve actuator 82. These are shown as being separate members, but it is to be understood that the valve assembly could be of unitary construction. The valve member 80 is adapted to engage the valve seat 72, and, as shown most clearly in FIG. 8, includes a body portion 84 and four radially extending flanges 86, the radial dimensions of these flanges being such that the outer faces thereof are in contact with the wall 76. This prevents the valve member 80 from "tilting" and in turn the beer passageway 72 during the movement thereof relative to the valve seat 74.

Although the aforementioned valve members 56 in the gas passageways are shown as having cylindrical body portions, I have determined that it is advantageous to use small radially extending flanges with these valve members, similar to the flanges employed with the beer passageway valve member 80.

The valve actuator 82 includes a permanent magnet 88 which is enclosed within a casing 90, the latter being provided with short, radially extending flanges 92 (FIG. 9) adjacent the top and bottom ends thereof, also for sliding engagement with the wall 76 of the beer passageway 72. A small Teflon plug 94 may be inserted in the upper end of the casing 90, primarily to maintain the magnet 88 in position within the casing. As mentioned above, it is preferable to have the casing made from a lightweight material.

Again, and as explained above, the length and position of the magnet 88 is offset from the center of the "mass" of the housing 38, whereby the valve actuator 82 urges the valve member 80 into the closed position in engagement with the valve seat 74.

It will be understood that the flanges 86 of the valve member 80 and the flanges 92 of the valve actuator 82, provide a space between said members and the wall of the beer passageway, to permit the free flow of beer therethrough when the valve member 80 is in the open position, as will be described more fully hereinafter.

A sleeve 96 is press fitted into the beer passageway 76 adjacent the lower end of the housing 38 (FIG. 2) to provide a shoulder 98 which limits the downward of the valve actuator 92.

As indicated hereinafter, and to those familiar with the beer siphoning art, the keg adapter 24 is installed in the keg 14 with the retaining ring 43 maintaining it in position, prior to the filling of the keg with beer. It is conventional to fill a keg of this type through thebung hole or opening 14 in the side wall of the keg, which opening is thereafter closed with the woodenbung or plug 15.

As explained above, the valve actuators 58 and 82 maintain their respective valve members in the closed position, thereby preventing the beer in the keg from flowing through the gas passageways 50 and the beer passageway 76 during the filling operation. Also, the beer within the keg is under a residual or filling pressure which is normally from about 9 to about 34 pounds per square inch, and this pressure obviously aids in maintaining the aforementioned valves in the closed position.

On the other hand, when the keg 14 is empty and the beer filling bung 15 has been removed for purposes of washing out the keg with the keg adapter 24 in position, a water hose fitting (now shown) can be engaged with the flange 34 (FIG. 2), and the water pressure will unseat the valve members 56 and 80 and permit the water to enter the interior of the keg through the beer passageway 76 and the gas passageways 50 and the vents 64. The absence of coiled springs and similar convolutions, achieved by the use of permanent magnets enclosed in streamlined casings, results in quicker and more effective cleaning of the keg adapter. Also, as mentioned above, coiled springs become "set" through usage and also break from fatigue failure, thereby requiring frequent replacement. Contrariwise, the permanent magnets, as valve actuators, will last as long as the keg adapter housing.

An alternative form of gas valve is shown in FIG. 10, and includes a spherical valve member 100 made from a tasteless and odorless resilient material such as Neoprene, and a valve actuator which comprises a permanent magnet 102 within a tubular case 104, the case being in sliding engagement with the lower wall 51 of the gas passageway, as previously described.

Turning next to a consideration of the construction of the tapper 22, as shown in FIG. 1 it is connected through hoses 18 and 21 with the supply of gas and with the faucet, respectively, and is continuously being used by uncoupling it from an empty keg and recoupling it to a full keg. Accordingly, as mentioned hereinabove, it is advantageous to have a tapper which is easy to use and which can be quickly engaged with the aforementioned keg adapter, followed by a simple and easy tapping operation.

The tapper 22 (FIG. 2) includes an upper tapper housing 106 and a lower tapper housing 108 interconnected for limited vertical relative movement. The upper housing includes a longitudinally extending tap rod assembly passageway 110 which is counter-bored at the top to provide an enlarged cavity 112 with an annular peripheral wall 114. An axially inclined camming slot 116 (FIG. 7) is provided in the wall 114 for a purpose to appear.

Slidably received in the passageway 110 is a tap rod assembly 118 which comprises an actuator and a tap rod 120. The actuator 118 includes a two-piece tubular fitting 122 and 123 containing external threads 124 at
the body of the tap rod. The passageway is also counter-bored adjacent the upper end to receive the annular wall 140 of the actuator and to provide a shoulder 172 for engagement with the bottom edge of said annular wall.

Considering next in greater detail the gas passageways in the tapper, and referring more particularly to FIG. 3, the upper tapper housing 106 is provided with a gas hose fitting 174 which receives the hose 18, and which is in communication with an L-shaped passageway 176, the lower end of said passageway slidably and sealingly receiving the upper end of a nipple 178 which has a passageway 180 therethrough.

The lower end of the nipple 178 is slidably and sealingly received in a passageway 182 provided in the lower tapper housing, which passageway, in turn, is in communication with a pressure chamber 184 (FIGS. 2 and 3) through ports 186 and 188.

As shown in FIG. 2, the pressure chamber 184 is adapted to be in communication with one side of a diaphragm chamber 190 through a passageway 192 of reduced diameter which provides a valve seat 194 adjacent one end thereof.

A diaphragm 196 of conventional construction extends across the aforementioned diaphragm chamber, the diaphragm supporting a valve body 198 which has an O-ring 200 received in a groove which is adjacent the free end thereof, the O-ring being adapted to engage the valve seat 194. The valve body 198 is biased toward the open position in a conventional manner, as by a coiled spring 202.

Also in communication with said one side of the diaphragm chamber 190 is a lower chamber 204 which receives a "duck-bill" resilient valve member 206, the collapsible end of said duck-bill valve extending through a port 208 which is in communication with the chamber 170 surrounding the body of the tap rod.

As will be explained more fully hereinafter, there is a limited relative vertical movement between the upper and lower tapper housings 106 and 108, respectively, to effect a tight seal between the tapper 22 and the adapter 24 and the construction for achieving this sealing relationship includes two opposed straps 210 (FIG. 3), only one of which is shown in FIG. 3.

The upper end of each strap 210 is secured in a recess 212 in the upper tapper housing, as by means of a machine screw 214. The center portion of each strap contains a slot 216 which receives the shank of a machine screw 218 which is fastened to the lower tapper housing 108, the slot being slightly larger than the diameter of the screw shank to provide for the limited relative movement referred to above. The lower end of each strap contains a hook portion 220 which is adapted to pass through the slot 47 and be received in the groove 45 of the retaining ring 43, thereby fastening the tapper to the keg adapter.

In use, keg adapters 24 are installed in kegs 14 of conventional construction, said adapters being maintained in position by retaining rings 43 of conventional design.

The kegs are filled with beer through the opening 14 in the side wall, and the opening sealed with a plug or bung 15 in a conventional manner.

As mentioned hereinafore, the valve members 56 close off the gas passageway 50 and the valve member 80 closes off the beer passageway 72, due to the forces exerted by their respective valve actuators which con-
tain permanent magnets. As also mentioned herein-
above, there is a filling gas pressure in the keg of from
about 9 to 34 pounds per square inch, and this pressure
assists in maintaining the aforementioned valves in the
closed position.

To tap a full keg 14, the keg is placed in an upright
position as shown in FIG. 1 with the keg adapter 24 at
the top, and the tapper 22 is pushed downwardly onto
the keg adapter 24 so as to cause the hook portions 220
of the straps 210 to pass through the slots 47 in the
re-taining ring 43 and into the annular groove 45, and to
cause the bayonet portion 66 of the adapter to be re-
ceived in the spring chamber 156 with the O-ring 20 in
sealing engagement with the inner wall surface 158 ...
, as shown in FIG. 2.

The tapper 22 is then physically rotated approxi-
mately 90 degrees to move the hook portions 220, in
the groove 45 and away from the slots 47.

If the tapper 22 had been in prior use or if the gas cy-
cil 16 were initially being opened, the compressed
air or carbon dioxide gas will have traveled or will ini-
tially travel through the hose fitting 174, through the
passageways 176, 180, 182, 186 and 188, and into the
passage chamber 184.

If the gas pressure were too high, the diaphragm 196
would move outwardly, thereby causing the O-ring 200
in the gas passageway 146 in the tap rod to 120 would
contain a column of beer.

To initiate the tapping operation, the handle 128
(FIGS. 3 and 6) is rotated in the clock wise direction
approximately 180 degrees, from the closed to the
open position. This causes the fittings 122 and 123 of
the actuator assembly to move downwardly relative to
the upper tapper housing 106 and the wall 130 moves
from under the head of the screw 142, until it engages
the top of the tap rod 120, and then forces the tap rod
120 in the downward direction until the bottom edge
160 of the spring chamber wall engages the horizon-
tally extending wall 44 of the adapter.

This downward movement of the tap rod 120 opens
the gas passages and the beer passage as shown in
FIG. 5, and as explained below.

Thus, when the tap rod 120 moves downwardly and
the O-ring 154 passes the shoulder 164, gas flows from
the chamber 170, downwardly through the chamber
166 and into the gas passageways 50 above the valve
members 56. This gas pressure will unseat the valve
members 56 against the holding force of the valve actua-
ators, and permit the gas to flow through the vents 64
and into the interior of the keg, provided the gas pres-
sure in the tank 16 is greater than the gas pressure in
the keg. This increases the pressure on the upper sur-
f ace of the liquid, and causes it to be forced upwardly
in the siphon tube 78.

Regarding the flow of beer, the initial downward
movement of the tubular fittings 122 and 123 causes
the O-ring 144 to pass the shoulder 136, thereby per-
mitt ing beer to reverse flow from the passageway 126,
into the annular groove 148, through the ports 150, and
into the beer passageway 146 in the tap rod and into
the spring chamber 156 above the valve member 80.

As downward movement of the tubular fittings 122
and 123 continues, and the wall 130 thereof engages
the upper end of the tap rod 120, the tap rod is moved
downwardly as previously described and the free end of
the coiled spring 162 moves the valve member 80 away
from its valve seat 74, thereby permitting the beer in
the siphon tube to flow upwardly through the beer pas-
sageway 72, past the valve member 80 and into the
spring chamber 156 where it would join the beer
which had reverse flow from the beer hose 21.

Although this mixing of old beer with new beer in
the tapper 22 might appear to be undesirable, it is actu-
al y advantageous because the column of existing beer be-
tween the tapper 22 and faucet 20 prevents the beer
from becoming "wild," as might occur if the beer line
21 were empty and the beer gushed from the keg to
the faucet when the latter were opened. Obviously, each
time the faucet 20 is opened, beer flows from the keg,
through the various beer passageways and the beer
hose to the faucet, because of the pressure of the gas
in the tap of the keg. And, each time the gas pressure
in the keg drops below the gas pressure in the cylinder
16 and in the gas passageways 50, the gas valves 54 will
be forced open to provide for the flow of additional gas
into the keg.

As mentioned hereinabove, there is relative move-
ment between the upper and lower tapper housings 106
and 108, respectively which results in a tight sealing
relationship between the tapper 22 and the adapter 24.

In describing the tapping operation, it was pointed
out that the tubular fittings 122 and 123, and the tap
rod 120 were moved downwardly to interconnect the
gas cylinder 16 with the gas passageways 50 and the
faucet 20 with the interior of the keg 13.

Referring to FIGS. 2 and 3 it will be noted that as the
fittings 122 and 123 are moved downwardly by actuat-
ing the handle 128, the bottom edge of the annular wall
140 of the upper tapper housing engages the shoulder
172 of the lower tapper housing, thereby forcing the
lower housing downwardly and away from the upper
housing. However, because the upper housing 106 is
connected to the retaining ring 43 by the straps 210
(FIG. 3), the aforesaid downward movement of the
lower housing achieves two results, viz. it forces the O-
ring 168 (FIG. 5) into tight sealing engagement with
the shoulder 48 at the top of the adapter 24, and it pulls
the hook portions 220 (FIG. 3) into a tight holding rela-
tionship with the groove 45 in the retaining ring 43.

To disengage the tapper 22 from the adapter 24 with
a column of beer in the various passageways, as previ-
ously described, the handle 128 is turned in the coun-
terclockwise direction to release the pressure between
the bottom edge of the annular wall 140 and the shoul-
der 172, and to cause the tubular fittings 122 and 123
to be moved in the upward direction relative to the
upper and lower tapper housings 106 and 108, respec-
tively, and relative to the tap rod 120. As the shoulder
136 passes the O-ring 144, beer is prevented from flow-
ing from the passageway 146 in the tap rod and into
the beer passage 126. And, when the O-ring 154 passes
the shoulder 152, gas is prevented from flowing from
the annular chamber 170 into the chamber 166.

When gas flow into the keg ceases and the gas pres-
sure is equalized on the ends of the valve members 56
and valve actuators 58, the valve member 56 are
moved into the closed position due to the force of the
valve actuators 58, as previously described, thereby
closing the gas passageways into the keg.

Further upward movement of the tap rod 120, either
under pressure from the column of beer in the passage-
way 146 or by reason of the wall 130 engaging the head
of the screw 142, causing the coiled spring 162 to move
upwardly and permit the beer valve member 80 to be
moved to the closed position due to the force of the
valve actuator 82.

Obviously, with the beer and gas valves in the keg
adapter in the closed position, and with the gas and
beer passageways in the tapper also being closed, the
tapper 22 can be disengaged from the keg adapter 24
by rotating it until the hook portions 220 of the straps
210 are in alignment with the slots 47 in the retaining
ring 43. The tapper 22 can then be pulled away from
the adapter 24.

I claim:
1. A tapper assembly for beer kegs and the like, com-
prising in combination;
an adapter for mounting in an opening in a keg or the
like, and including a housing containing magnetic
material;
a liquid passageway in said adapter housing contain-
ing an inlet and an outlet with a first valve seat
therebetween, the inlet being adapted to be in com-
munication with the interior of a keg in which the
adapter may be mounted;
a first valve member associated with said first valve
seat and movable between an open position and a
closed position relative thereto, said first valve member
being biased toward the closed position by means
including a permanent magnet;
a gas passageway in said adapter housing contain-
ing an inlet and an outlet with a second valve seat
therebetween the outlet being adapted to be in com-
munication with the interior of a keg in which the
adapter may be mounted;
a second valve member associated with said second
valve seat and movable between an open position and a
closed position relative thereto, said second valve member
being biased toward and closed position
by means including a permanent magnet;
a tapper in selective sealing engagement with said
adapter and including a housing;
a gas passageway in said tapper housing having an
inlet and an outlet with third valve means therebe-
tween movable between an open position and a
closed position, the inlet being adapted to be con-
ected to a source of gas under pressure, and the
outlet being in communication with the inlet of the
gas passageway in the adapter housing when the
tapper and the adapter are in sealing engagement;
a liquid passageway in said tapper housing having an
inlet and an outlet with fourth valve means there-
tween movable between an open position and a
closed position, the inlet being in communication
with the outlet of the liquid passageway in the
adapter housing when the tapper and the adapter
are in sealing engagement;
actuating means supported in the tapper housing and
movable between an operative and an inoperative
position;
means responsive to the movement of the actuating
means from the inoperative to the operative posi-
tion for moving the third and fourth valves in the
tapper housing from the closed to the open posi-
tion; and
means responsive to the movement of the actuating
means for moving the first valve in the adapter
housing from the closed to the open position.
2. A tapper assembly according to claim 1, further
including means responsive to the movement of the ac-
tuating means from the inoperative position to the op-
erative position urging said tapper and said adapter into
said sealing engagement.
3. A tapper assembly according to claim 1 wherein
the second valve member is movable from the closed
position to the open position when the gas pressure in
the inlet of the gas passageway in the adapter housing
exceeds by a predetermined amount the gas pressure in
a keg in which the adapter is mounted.
4. An adapter for mounting in an opening in a keg or
the like, comprising:
a housing containing magnetic material;
a liquid passageway in said housing containing an
inlet and an outlet with a first valve seat therebe-
tween, said inlet being adapted to be in communica-
tion with the interior of a keg in which the
adapter may be mounted;
a first valve member associated with said first valve
seat and movable between an open position and a
closed position relative thereto;
first valve actuating means biasing said first valve to-
ward the closed position and including a movable
permanent magnet in operative engagement with
the first valve member;
a gas passageway in said housing containing an inlet
and an outlet with a second valve seat therebe-
tween, the outlet being adapted to be in communi-
cation with the interior of a keg in which the
adapter may be mounted;
a second valve member associated with said second
valve seat and movable between an open and a
closed position relative thereto; and
second valve actuating means biasing said second
valve toward the closed position and including a
movable permanent magnet in operative engage-
ment with the second valve member.
5. An adapter according to claim 4, wherein the inlet
of the gas passageway and the outlet of the liquid pas-
segway are in communication with a source of liquid
under pressure for cleaning said passageways, and said
valve actuating means yieldably bias said first and sec-
ond valve members toward the closed position.
6. An adapter according to claim 4, wherein each
valve actuating means comprises a permanent magnet
with a casing slidably mounted in the housing.
7. An adapter according to claim 4, wherein each
valve member is separate from its respective valve ac-
tuating means, and each valve actuating means com-
prises a permanent magnet.
8. An adapter according to claim 4, wherein the li-
quid passageway includes a smooth inner wall surface;
the first valve actuating means comprises a permanent
magnet within an elongated casing, said casing being
spaced from said inner wall surface to provide for liq-
uid flow therebetween; and said casing contains spaced
apart, transversely extending flanges in sliding engage-
ment with said inner wall surface.
9. A tapper for use with an adapter housing which is
adapted to be mounted in an opening in a keg or the
like, comprising:
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a housing;
a gas passageway in said housing having an inlet and an outlet with a gas valve therebetween movable between a closed position and an open position, the inlet being adapted to be connected to a source of gas under pressure;
a liquid passageway in said housing having an inlet and an outlet with a liquid valve therebetween movable between an open position and a closed position, the outlet being adapted to be connected to a liquid dispensing device;
acting means supported in the housing and movable between the inoperative position and an operative position; and
tapping means supported in said housing and responsive to the movement of the actuating means from the inoperative to the operative position for moving said gas valve and said liquid valve from the closed to the open position.

10. A tapper according to claim 9, wherein the tapping means includes an elongated tap rod with a longitudinally extending chamber therein, which chamber forms part of said liquid passageway, and the tap rod contains spaced-apart, external shoulders which form part of said gas valve and said liquid valve.

11. A tapper according to claim 10, wherein the chamber in said tap rod is open at one end to provide the inlet to said liquid passageway, and the other end of the chamber is in communication with a transversely extending passageway which terminates adjacent one of said external shoulders which forms part of the liquid valve means.

12. A tapper according to claim 9, wherein the actuating means includes a tubular member having inner and an outer ends, which member is rotatable and axially movable relative to said housing, and in which said outer end comprises the outlet of said liquid passageway.

13. A tapper according to claim 9, wherein the actuating means includes a tubular member having inner and outer ends, which tubular member is rotatable and axially movable relative to said housing, and which tubular member contains an annular inner wall adjacent the inner end thereof; and the tapping means includes an elongated tap rod with a longitudinally extending chamber therein, one end of said tap rod being received in the inner end of said tubular member in sliding, sealing engagement with said annular inner wall thereof.

14. A tapper according to claim 13, wherein said inner end of the tubular member and said one end of the tap rod contain interengaging means providing limited relative axially movement therebetween.

15. A tapper according to claim 14, wherein the tubular member contains an internal shoulder and the tap rod contains an externally mounted O-ring for axially movement relative to said shoulder, and said shoulder and said O-ring comprise said liquid valve in the liquid passageway.

16. A tapper according to claim 9, wherein the gas passageway includes a chamber in the housing, said chamber having an inner wall terminating in a shoulder; the tapping means includes an elongated tap rod mounted in said housing for limited axial movement relative thereto and extending through said chamber, said tap rod including an externally mounted O-ring for sliding sealing engagement with said inner wall of the chamber, said O-ring and said shoulder comprising said gas valve in the gas passageway.

17. A keg and tapper assembly, comprising, in combination:
a keg having an opening in one wall thereof;
a flange adjacent to said opening;
an adapter housing mounted in said opening, said housing containing liquid and gas passageways therethrough;
liquid valve means and gas valve means in said liquid and gas passageways, respectively, and movable between an open position and a closed position; retaining means in engagement with said flange for retaining the adapter housing in position;
a tapper in engagement with said adapter housing and containing liquid and gas passageways therethrough for communication with the liquid and gas passageways in the adapter housing;
liquid and gas valves in the liquid and gas passageways in the tapper, and movable between an open position and a closed position; an actuating member supported in the tapper and movable between an inoperative position and an operative position; means responsive to the movement of the actuating member from the inoperative position to the operative position for moving said liquid and gas valve in the tapper to the open position, and for moving the liquid valve means in the adapter housing to the open position; and means responsive to the movement of the actuating member from the inoperative position to the operative position for forcing together the tapper and the adapter housing in sealing relationship.

18. A keg and tapper assembly according to claim 17, wherein the tapper includes an upper housing and a lower housing interconnected for limited relative movement, the upper housing being connected to said retaining means and the lower housing being in engagement with the adapter housing; and wherein the means for forcing together the tapper and the adapter housing in sealing relationship includes means supported on the upper tapper housing for movement relative to said upper tapper housing and for engagement with the lower tapper housing to move the lower tapper housing from the upper tapper housing responsive to the movement of the actuating member from the inoperative position to the operative position.

19. A keg and tapper assembly according to claim 17, wherein said liquid and gas valves in the tapper and the liquid valve means in the adapter housing are moved to the closed position responsive to the movement of the actuating member from the operative position to the inoperative position.

* * * *

65
Column 1, line 31, "keg" should read --kegs--

Column 6, line 44, "passageway" should read --passageways--

Column 7, line 33, "port" should read --ports--

Column 11 line 43, "toward and closed" should read --toward the closed--

Column 13, line 13, "between the inoperative" should read --between an inoperative--

Column 14, line 32, "valve" should read --valves--
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,758,008 Dated September 11, 1973

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:

Column 14, line 56, "valves in the tapper" should read

-- valve means in the tapper --.

Signed and Sealed this Twentieth Day of September 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

LUTRELLE F. PARKER
Acting Commissioner of Patents and Trademarks