

March 12, 1940.

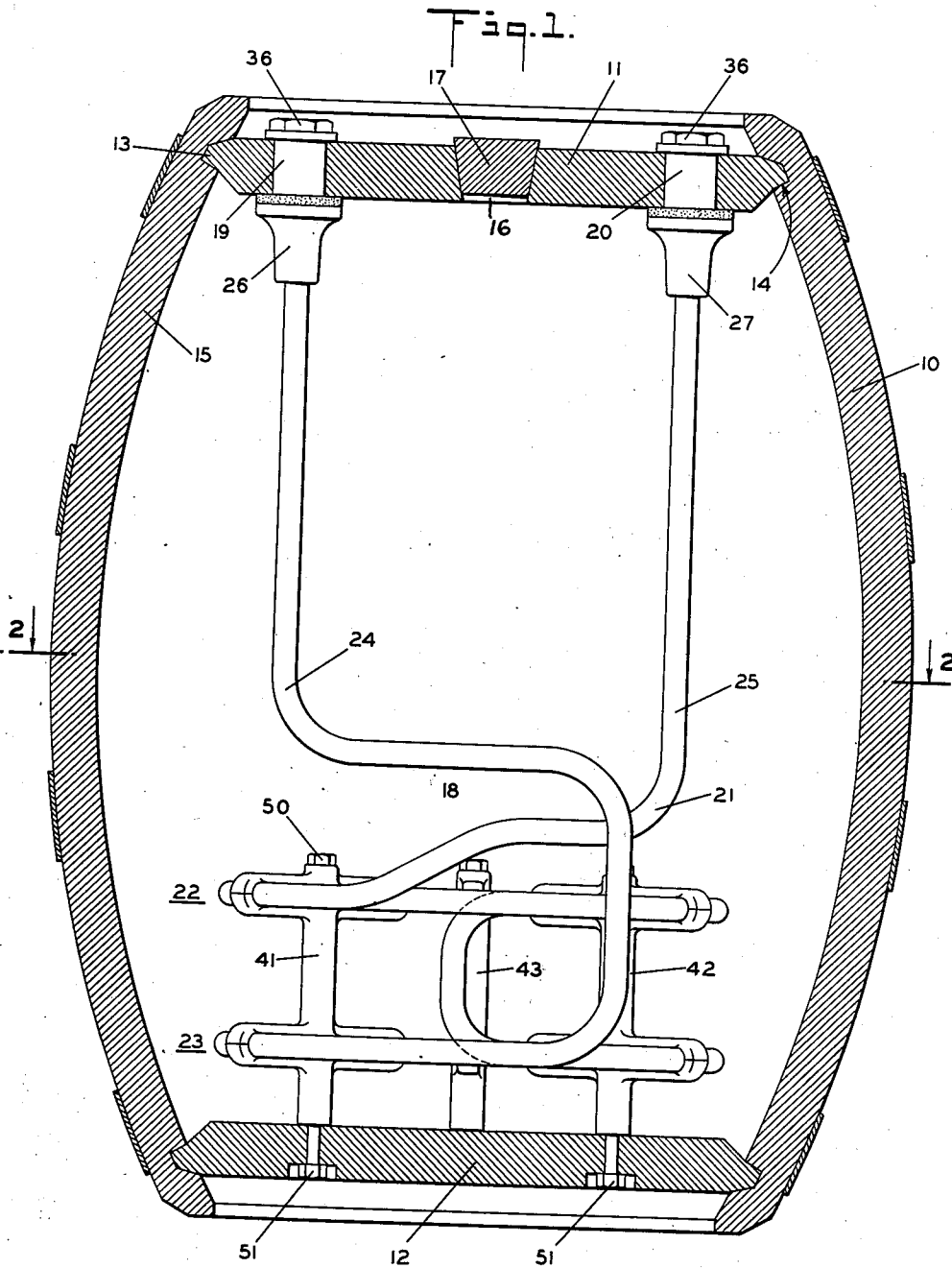
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2,193,445

BEER KEG

Filed July 27, 1936

2 Sheets-Sheet 1



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Fig. 2.

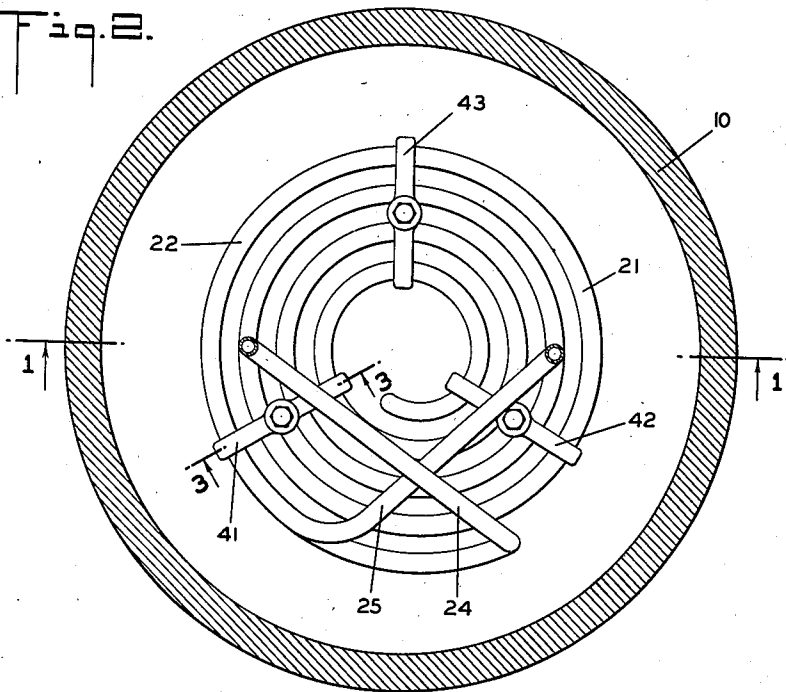


Fig. 3.

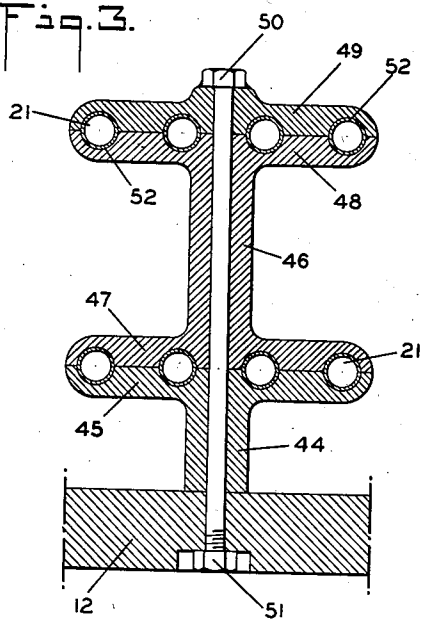
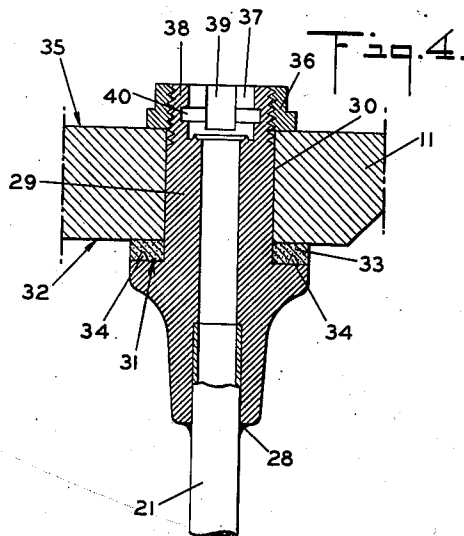


Fig. 4.



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BEER KEG

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5 Claims. (Cl. 257—15)

The invention relates to a beer keg of the type in which beer is transported from the brewery to the user and which is designed to be cooled in the original container and from which container the cooled beer is vended from time to time.

In this type of beer keg a cooling coil is disposed in the keg with the ends of the coil in position accessible from the outside of the keg for ready and quick attachment to a cooling system at the user's place of business.

In devices of this character, it is, of course necessary to have the ends of the coil pass out through a head or through the side of the keg and which structure is liable to develop a leakage through the joints formed between the ends of the coil and the keg part through which they extend and of course the possibility of leakage increases with increase in the area of the joints so formed. Any such possible leakage is highly detrimental to the maintenance of the internal gas pressure in the kegs as shipped from the breweries or as introduced at the place of discharging the keg of its contents.

Accordingly one object of the invention is to provide means generally designed to defeat any tendency to such leakage and the present disclosure features the use of connections and coil anchoring means between the keg and the coil to form the necessary joints with a minimum area of possible leakage and to employ gaskets and similar sealing means so arranged that the structure will tend to defeat any possibility of leakage out of the keg past the intruded ends of the contained cooling coil.

Beer kegs of the character under discussion develop quite a tendency under transporting conditions to which such kegs are subjected to acquire a whipping of vibratory action in the contained coil which has a tendency to loosen the connections between the coil and the keg with the resulting possibility of leakage and any prolonged vibratory movement of the coil is apt to develop structural deterioration of the same with additional possibility of leakage between the coil interior and the interior of the keg.

Accordingly another object of the invention is to provide a contained cooler construction, preferably in the form of a long coil, which will be ruggedly anchored in position at a plurality of widely spaced apart points and otherwise designed to minimize, if not entirely eliminate, any such destructive whipping or vibratory action in the contained coil.

Beer kegs which have been in use for a long time tend to reduce their maximum diameter and

thus become elongated and otherwise modify their initial configuration particularly after prolonged and rough usage with the result that any cooling mechanism contained therein and fastened to the opposite heads is apt to be pulled out of place and thus develop possible leakage between its several portions and in its connections with the heads of the keg. The changes in temperature to which such kegs are subjected are also liable to loosen the connections between the coil ends and the head to which they are fastened.

Another object of the invention, therefore, is to provide a form of cooling coil which will automatically compensate for any change in keg conformation or in its own all-over length.

This aspect of the invention is attained by providing kinks, bends or other surplus lengths in the tubing and by so arranging the coil that the portions thereof on opposite sides of these bends and which are fastened to the heads, may move, or rather portions of the bends may move relative to each other, without disturbing the connections with the heads simply by the bends either becoming more bent as the heads tend to approach each other or more straight as the heads tend to recede from each other. In the form of the invention herein disclosed this permissible elongation or collapsing of the length of the coil considered as a whole between the heads is most easily provided simply by forming the upper portion of the tubing somewhat L-shaped thus including an angled part with one arm extending transversely of the axis of the keg and which transversely extended arm is free to move axially of the keg.

Beer kegs are subjected to rather rough usage as when they are dropped to the ground off the carrying trucks and this practice would also tend to loosen any ordinary coil connections between the coil and the keg.

The present disclosure features a coil construction in which most of the coil is contained in a closely wound group or spiral in one or more tiers confined to the lower portion of the keg and secured to the adjacent head by a rugged form of bracket, of which three are showed in the structure herein disclosed, and which will act cooperatively not only to hold these groups fixed to the lower head but will also maintain the groups or tiers fixed relative to each other and thus hold the major portion of the coil immovable in the keg and at the same time engage the thin shelled tubing in such way as to avoid crushing, perforating or otherwise weakening the tubing or un-

duly restricting the exposed heat transference area of the coil.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form embodying the invention, and the invention also consists of certain new and novel features and combination of parts hereinafter set forth and claimed.

In the accompanying drawings:

Fig. 1 is a view in vertical axially section through a beer keg filled with beer under pressure and provided with a cooling coil constituting a preferred embodiment of the invention and taken on the plane indicated by the line 1—1 of Fig. 2;

Fig. 2 is a horizontal sectional view mid-high of the keg and taken on the plane indicated by the line 2—2 of Fig. 1 looking downwardly onto the uppermost tier of the cooling coil;

Fig. 3 is a vertical sectional view through one of the coil mounting brackets and taken on the plane indicated by the line 3—3 of Fig. 2; and

Fig. 4 is a vertical sectional view taken axially through one of the couplings shown in side elevation at the upper ends of the coil in the upper portion of Fig. 1.

In the drawings there is shown at 10 a beer keg of conventional form and design provided with an upper head 11 and a lower head 12. These heads are of conventional construction and are each provided with an outstanding peripheral flange 13 fitted into groove 14 formed on the inner face of the side 15 of the keg. The upper head 11 is provided centrally thereof with an opening 16 designed to contain a plug or closure 17 while the keg is being transported from the brewer to the user and which plug is intended to have a dispenser device or discharge nozzle forced therethrough following conventional practice in this respect. While the invention is illustrated in connection with a beer keg, it is obviously within the scope of the disclosure to have the container in the form of a barrel or other receptacle designed to contain any fluid under pressure and hereinafter in using the word "keg" it is understood to include any receptacle capable of being used as a beer keg is at present employed.

A cooling coil 18 has its opposite ends 19 and 20 permanently secured to the upper head 11. The coil as a whole is formed for the most part of a long, somewhat flexible, one-piece tubing 21 arranged for the most part in two superposed tiers 22 and 23, each containing a plurality of spirally arranged turns terminating in two upstanding L-shaped lengths or risers 24 and 25. The upper ends of these risers are intruded into the lower ends of couplings 26 and 27 forming the ends of the coil. These couplings are alike and therefore the detailed description of one of them, as by reference to the details of Fig. 4, will be equally applicable to the other. This tubing is a thin shelled copper tube tin-plated on its exterior side to minimize any reaction between the tubing and the contents of the keg. The ends of the tubing are soldered to the lower ends of the couplings by silver solder rings 28 which hermetically seal the joints between the tubing and the couplings.

The coupling is a rugged tubular brass member, the upper end of which is machined to form a cylindrical barrel 29 having a more or less snug, driven-tight fit in its associated aperture

30 drilled through the head 11. The coupling is provided at the base of the barrel and thus within the keg with an upwardly facing annular shoulder 31 between which and the undersurface 32 of the head 11 is fitted a lead gasket 33. Circumferentially spaced, upwardly pointed prongs 34 project upwardly from the shoulder and are embedded in the underside of the gasket to hold the gasket fixed to the shoulder. The upper end of the barrel 29 which projects slightly above the top face 35 of the head 11 is externally screw threaded and is engaged by an external, flat, binding nut 36. It is understood from this construction that tightening the nut 36 compresses the lead gasket between the shoulder 31 and face 32 and this insures a hermetic sealing of the coupling to prevent escape of gas pressure or other contents from the interior of the keg through the cylindrical joint formed between the wooden head and the coupling barrel.

The upper end of the coupling which projects from the upper head 11 has its bore enlarged as shown at 37 and this forms a ring-like extension 38 encircled and reinforced by the nut 36. The extension 38 is slotted longitudinally at diametrically opposite sides as shown by one of the slots 39 in Fig. 4 and the inner face is grooved for a short distance circularly and horizontally from each of the vertical slots 39 as shown at 40 to form the female element of a readily detachable coupling by means of which the coil in the keg is coupled at will through a coating male nipple having outstanding prongs, to a supply of ice water or other refrigerant outside of the keg, hereinafter referred to broadly as an exterior cooling system.

In constructing the keg in those forms where the coil is not anchored to the opposite or lower head as herein featured but is simply permitted to hang freely from the upper head without the brackets herein disclosed, the upper ends of the cooling coil are secured in place as herein indicated, that is, are secured to the upper head before the upper head is inserted in place in the groove 14 following conventional practices in this respect. In this way access is permitted to the gasket and adjacent parts before the coil is finally mounted in the keg and when dismantled or prior to its initial mounting may be subjected to the usual testing operations to discover leaks and faulty assembling of the parts.

In the form of the invention herein specifically illustrated the lower end of the coil is anchored to the lower head 12 so as to prevent whipping about of the coil under the conditions above outlined. For this purpose there is shown three upstanding cross-head posts or brackets 41, 42 and 43 resting on the bottom of the keg and equidistantly spaced apart circumferentially as shown in Fig. 2.

As these brackets are of identical construction a detailed description of any one by reference to Fig. 3 will be sufficient for the others. Each bracket is in the form of a pair of superposed cross arms and is of three superposed parts; a T-shaped base 44 having an arm or head 45 at its upper end; an intermediate H-shaped member 46 having a lower arm 47 resting on the arm 45 and having an upper arm 48. A top plate or arm 49 fits on top of the upper arm 48 and forms the top of the bracket. A long bolt 50 passes through the three parts of the bracket, through the lower head 12 and a nut 51 engages the lower end of the bolt and acts to secure the three parts of the bracket together and to

secure the bracket with its contained coil portions to the lower head of the keg. The opposing faces of the several arms are provided with registering recesses to form coil receiving channels 52 in which the turns of the coil are set. The channels are so machined that the portion of the coil contained therein has a snug fit and is clamped between the arms engaging the same without crushing the tubing or even forming a constriction therein. In this way the tubing is maintained with its maximum fluid conducting capacity from end to end and the internal diameter of the tubing is continued undiminished through the bore of the coupling forming the ends of the coil.

In the preferred form of the invention herein illustrated the coil is first mounted between and secured to the opposite heads as above indicated before the heads are mounted in the side 15 forming the balance of the completed keg. With the coil thus exposed before it is concealed in the keg inspection, repair and replacement of worn parts of the same is facilitated. It is also possible to interchange an assembly including a head or heads and associated coil for a worn-out assembly in another keg in the process of reconditioning the kegs.

In use it will be understood that the completed keg with its contained cooling coil is cleaned and filled at the brewery as is the usual practice in filling beer kegs and the package thus formed is then shipped to the user ready for use or for the customary keg pre-cooling. When desired for use at the bar the keg is located in place and the usual nozzle or other dispensing apparatus is fitted to the keg. The external cooling system at the bar includes a pair of flexible conduits terminating in the male elements of a bayonet joint form of connectors. These connectors are intruded into the bore 37 and by means of a half turn the outstanding pins of such male elements are caused to move into the slots 40 which are beveled to insure a snug fit of the pins in the slots. By this means cold or ice water or other cooling refrigerants are circulated through the coil 13 to cool the beer or other contents of the keg. When the keg is emptied the bayonet joint connectors are loosened, the old keg removed and a fresh filled keg connected to the cooling system as above outlined and the old keg is returned to the brewery for cleaning and refilling.

By means of such a device, it is possible to cool the beer in its original container and without necessity of transferring the beer to cooling vats or of introducing cooling mechanism into the keg. In this way there is avoided the possibility of introducing foreign matter into the keg at the place of vending the beer. With such a form of keg the beer is maintained in its initial, sanitary condition and otherwise the beer is in the condition in which it was intended by the brewer to be served. As the keg is maintained in its sealed condition both before and during its connection with the vendor's cooling system, fermentation risks are minimized and the structure disclosed herein tends to maintain the original seals even

though the device is subjected to the hard usage herein before mentioned.

I claim:

1. The combination of a keg provided with a lower head, a coil in the keg having a plurality of turns disposed in a horizontal plane, a bracket including a T-shaped bottom member and another member superposed thereon, the adjacent faces of said members being recessed to provide a plurality of spaced apart coil-turn receiving grooves, certain of the turns of the coil contained in said grooves, and a clamping bolt extending through said members and through the keg head to clamp the coil turns between said members of the bracket and to secure the bracket and coil to the keg head.

2. A keg provided with heads at opposite ends, a cooling device permanently mounted in the keg, said device including a coil having a group of turns located in a flat plane, means for securing said uniplanar group of turns to one of the heads and means for securing the ends of the coil to the other head.

3. The combination of a keg provided with an upper head having a pair of apertures extending therethrough, a pair of couplings, one fitting in and extending through each of said apertures, each coupling provided within the keg with an annular shoulder, a gasket surrounding each coupling between its shoulder and the adjacent face of the head, a nut in screw threaded engagement with the outer end of each coupling for clamping the gasket firmly between the shoulder and said adjacent face, each coupling having a bore extending axially therethrough, a cooling coil within the keg having its ends intruded into and secured to the inner ends of the bores of the couplings, means permanently soldering the intruded ends of the coil to the couplings, and the outer end of each of the coupling bores being enlarged and provided with an element of a bayonet joint for attachment to an exterior cooling system.

4. A cooling device for a keg comprising a single length of tubing bent intermediate its ends to form two superposed tiers of spiral turns, the ends of the tubing forming two L-shaped extensions from the tiers, a coupling at each end of said extensions and into which the ends intrude, and a soldering ring closing the joint between each coupling and a bracket spacing the tiers from each other.

5. A beer keg provided with heads at opposite ends, a cooling pipe within said keg including a coil having a plurality of convolutions near one of said heads, extending in one or more flat spiral coils, clamping means for rigidly attaching said convolutions to said head to restrain vibration thereof and risers from the ends of said coil, extending to the opposite head and having their ends secured to said head and opening through said head for releasable attachment to an external cooling system, said risers being of length greater than the distance between their ends.