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C. MELDAU

2,070,951

COOLER

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2 Sheets-Sheet 2

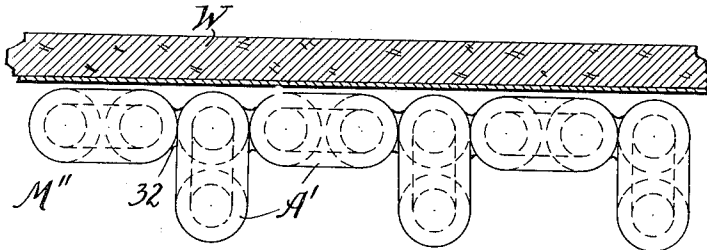


Fig-7

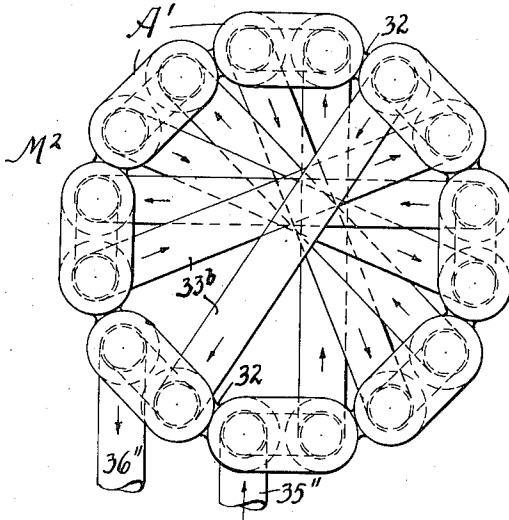


Fig-9

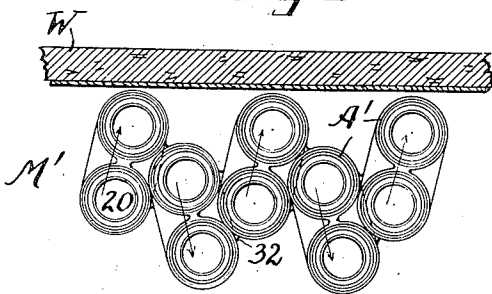


Fig. 3a

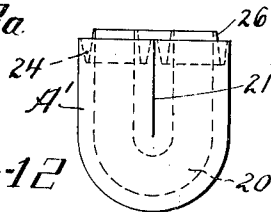


Fig. 12

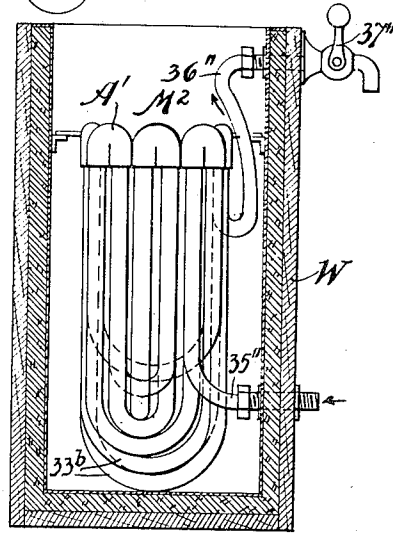


Fig-8

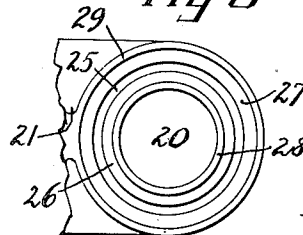


Fig. 11

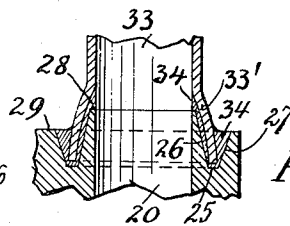


Fig. 10

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COOLER

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4 Claims. (Cl. 285—210)

My invention relates to coolers such as are used for cooling fluids or liquids, and particularly beverages such as beer. The object of my present invention is to improve coolers of the type employing one or more manifolds and pipes in connection therewith. One feature of my invention relates to the structure of the manifold; another feature relates to the joint between the manifold and the pipes, and still another feature relates to a special arrangement of manifold and pipes. These features and others will now be described in detail with reference to the accompanying drawings, and the novelty will then be particularly pointed out in the appended claims.

In said drawings, Fig. 1 is a bottom view of a manifold blank produced in accordance with my invention; Fig. 2 is a side elevation thereof, with parts in section; Fig. 3 is a top view of one form of manifold made from the blank shown in Figs. 1 and 2 after cutting the same into units and connecting such units in a relation different from their original relation; Fig. 3a is a top view of another manifold of the same type but slightly different construction; Fig. 3b is a section on line 3b—3b of Fig. 3; Fig. 4 is a side elevation showing two manifolds of the character of Figs. 3 and 3a respectively connected by straight pipes; Fig. 5 is a cross section of a cooler tank provided with manifolds and pipes such as shown in Figs. 3, 3a and 4; Fig. 6 is a cross section of a cooler tank with a different arrangement of manifolds and pipes; Fig. 7 is a plan view indicating another construction of a manifold; Fig. 8 is a vertical section of a cooler tank with a manifold and pipe arrangement such as represented in plan view in Fig. 9; Fig. 10 shows upon an enlarged scale, an end view of a portion of one of the manifold units produced from the blank shown in Figs. 1 and 2; Fig. 11 is a longitudinal section showing a portion of such unit in connection with the adjacent end of a cooler pipe; and Fig. 12 is a side view of one of such units.

In manufacturing manifolds to be used as elements in the construction of the improved coolers, I prefer to proceed as follows:

I make a casting (of suitable metal, such as bronze) in the nature of a bar-like body A such as shown in Figs. 1 and 2, having U-shaped channels 20 open at their ends. The two parallel members of each U-shaped channel are separated by an intervening longitudinal partition or web 20' (Fig. 2). Each U-shaped channel is bounded or surrounded by a portion of metal having walls of substantially equal thickness, thus forming seats or recesses 21 in opposite outer faces of the

body A, as shown in Fig. 1 and at the central portion of Fig. 2. Adjoining U-shaped metal portions, each containing one of such channels, are connected with each other, as indicated at 22. The free ends of the channeled metal portions are preferably in the same plane, and furthermore, I prefer to give the edges of the metal, adjacent to such free ends, a wavy or irregular form, as indicated at 23 at the left-hand portion of Fig. 2, for the purpose of facilitating the separation of the casting from the mold. After taking the casting from the mold, I prefer to apply a protective coating of tin or other suitable material to the casting, both externally and within the channels 20. I then smooth the inner surfaces of the channels 20 at their ends, if required, and cut into the annular edge portions 23, annular grooves 24 which taper from their open ends to the opposite ends, at which a flat transverse annular surface 25 is produced. The two annular surfaces 25 at the bottom of the grooves 24 belonging to the same channel 20 are preferably in the same transverse plane, as shown. At this inner end of each groove 24, the wall surrounding the adjacent channel end is thickest, such thickness diminishing to the outer end of the channel. Preferably, both the inner circumferential wall 26 of the groove 24 and its outer circumferential wall 27 are inclined with respect to the longitudinal axis of the respective channel end. The wall 26 and the channel 20 extend beyond the wall 27, so that the end surface 28, adjacent to said channel, is in advance of the surface 29. The surfaces 28 and 29 are preferably also smoothed and made perpendicular to the longitudinal axes of the end portions of the channels 20.

The next operation consists in severing units, each containing one U-shaped channel 20, from the bar-like body or blank shown in Figs. 1 and 2. This severing may be carried out by cutting or sawing through the connecting portions 22 as indicated by the lines 30. I thus obtain units A' of the character shown in Fig. 12, details thereof being illustrated in Figs. 10 and 11.

From the units thus obtained I form manifolds in which such units occupy a position relatively to each other different from the one which they had in the original blank or body. Several different forms of manifolds which may be thus produced are illustrated in the drawings, but I do not wish to restrict myself to these particular forms. In Fig. 3 and at the upper portions of Figs. 4 and 5, I have indicated an upper manifold M formed by fitting six units A' together in such

a fashion that the first, third and fifth units will be parallel with each other and substantially at right angles to the second, fourth and sixth units which are likewise parallel among themselves. Each unit is connected with its neighbor at points midway between the two end members of the channel 20. The odd-numbered units may be said to form one set, and the even-numbered units another set. The axes or centers of corresponding channel ends of the same set are in the same plane, or in a straight line as indicated in Fig. 3, thus enabling the manifold to be placed close to the straight (plane) wall of a cooler W. The connection of adjoining units is made in any suitable manner, preferably by soldering as indicated at 32, and in some cases I prefer to apply the solder in such a manner as to leave open channels 32' of about triangular cross section as indicated in Fig. 3 (see also Fig. 3b); that is, the solder will be applied only to the outer surface of the adjoining units A'. The lower manifold M' shown in Figs. 4 and 5 is illustrated more in detail in Fig. 3a. The units of this lower manifold are so arranged that the two ends of the channel 20 of the same unit will be in the proper position for vertical alignment with ends of the channels 20 of two adjoining units of the upper manifold M. Since, as referred to below, both the inlet and the outlet connections are made to the upper manifold M, in the particular embodiment shown in Figs. 3 to 5, it follows that the lower manifold M' will require one unit A' less than the upper manifold, that is to say, five units instead of six. The first, third, and fifth of these five units are parallel to each other, as shown in Fig. 3a, while the second and the fourth units are also parallel to each other, but at an angle to the other three. This angle, however, is not a right angle as in Fig. 3, but altered so as to bring the channel ends of the lower manifold units A' into the desired registry with the corresponding channel ends of the upper manifold units. Both in Fig. 3 and in Fig. 3a, the inclination or obliquity of the odd-numbered units (first, third, etc.) is opposite to that of the even-numbered units. In Fig. 3a as well as in Fig. 3, the centers of corresponding channel ends of the same set are in a straight line.

The vertically-aligning channel ends of the upper and of the lower manifold are shown connected by straight vertical pipes 33. The two manifolds having been formed or assembled from units A' as set forth, their channels 20 are connected with the respective ends of the pipes 33, for instance in the manner illustrated by Fig. 10: I take a pipe 33 and expand its end as indicated at 33' in Fig. 10. The inner diameter of this pipe is equal to the diameter of the channel 20. The expanded end 33' of the pipe is fitted into the groove 24 and the angle of said end 33' corresponds substantially to the inclination of the inner circumferential wall 26 of the groove 24. The manifold M or M' is held in such a position that the pipe end 33' will be the lower end of the pipe. I then pour solder into the groove 24 around the pipe end 33', as indicated at 34. Such solder will adhere strongly to the inner and outer surfaces of the pipe end 33' as well as to the walls 25, 26, 27 of the groove 24 and to the end surfaces 28, 29. In fact, some of the solder will rise along the inner surface of the pipe end 33' as clearly indicated in Fig. 10, thus practically filling the angle between the surface 28 and the inner surface of the pipe end

33'. Any surplus solder will flow down on the outer surface of the unit and not into the pipe and into the channel 20. This is due to the fact that the surface 29 is at a lower level than the surface 28 or in other words, the open end of the channel 20 projects beyond the surface 29 of the unit. I thus guard against any obstruction which might be formed in the pipe and in the channel by solder flowing into them. It will be understood that the pipes 33 are generally tinned on the inside which facilitates the spreading of the solder. The tinning is applied to the entire inner surface of the pipes so that the beer or other beverage may not be contaminated.

In Figs. 4 and 5, I have shown an upper manifold M and a lower manifold M' of the types described with reference to Figs. 3 and 3a. These manifolds are in registry with each other and differ in the particulars explained above and also in that one of them faces upwardly and the other downwardly. These two manifolds are connected by straight pipes 33 in the manner just described with reference to Fig. 11. Fig. 5 shows these two manifolds located adjacent to the rear wall of a cooler box or casing W of any suitable construction. One of the units A' of the upper manifold M serves as the inlet unit and has one end of its channel 20 connected with an inlet pipe 35 through which beer or other beverage is supplied in any customary or approved manner. The direction of flow of the beer through the channels 20 of the several manifold units is indicated by arrows in Figs. 3 and 3a. The last unit of the upper manifold M has one end of its channel 20 connected with the outlet pipe 36 leading to the cock or faucet 37 of any suitable construction. The inlet pipe 35 and the outlet pipe 36 are secured in any suitable manner to the front wall of the cooler box W and this is sufficient to support the two manifolds and the pipes connecting them in proper position within the cooler box. When channels 32' are left as referred to hereinabove, the circulation of the cooling medium contained in the box or tank W is facilitated. It will, of course, be understood that the pipes 33 are not in contact with each other so that ample space is left for the circulation of the cooling liquid in the tank W.

In Fig. 6, I have shown a construction in which two parallel manifolds M of identical construction are disposed along the front wall and the rear wall respectively of the tank W. These two manifolds are of the same character as illustrated in Fig. 3, but instead of being connected by straight pipes, as in the case of the superposed manifolds of Fig. 5, they are interconnected by U-shaped pipes 33a. The inlet pipe 35', outlet pipe 36' and discharge cock or faucet 37' are of the same character as in Fig. 5.

In some cases it may be desirable to construct the manifold in such a manner as it will not project so much from the adjacent wall of the cooler tank as in the form shown in Figs. 3 and 3a. In such cases I may adopt the arrangement indicated in Fig. 7 where the first, third and fifth units A' are in line with each other and close to the wall of the cooler tank W; these units are spaced from each other just enough to allow the insertion between them of the second and fourth units, which, like the sixth unit, extend at right angles to the adjacent wall. Of course, the units forming this manifold M'' are soldered together in substantially the same manner as has been described in connection with Fig. 3. Manifolds of this type may be substituted for those shown in

Figs. 5 and 6. The construction illustrated by Fig. 7 shares with those shown in Figs. 3 and 3a, the arrangement of the centers of corresponding channel ends of the same set in a straight line.

5 In Figs. 8 and 9, I have illustrated a manifold M^2 which is of annular shape, adjoining units A' being connected by solder 32 at their ends and placed in such a way that together they will form an annular series. At 35'' I have indicated the
10 inlet pipe, at 36'' the outlet pipe and at 37'' the discharge cock or faucet, all of which may be of any suitable construction. The pipes 33^b which connect the channels 20 of different units A' are of U-shape, their upper ends connecting with
15 the corresponding channels in the manner described with reference to Fig. 11, it being understood that the U-shaped channels are in inverted position, that is to say, with their parallel members extending downwardly to the pipes 33^b.
20 The arrangement of the several pipes 33^b and the flow of the beer or other beverage through the several pipes and units is indicated by arrows in Fig. 9. In this case also the inlet pipe 35'' and the outlet pipe 36'' may suffice as supports for the
25 manifold and the connecting pipes 33^b. The latter pipes are preferably arranged to connect units located on opposite sides of the annular series of units forming the manifold. These U-shaped connecting pipes 33^b cross one another at their
30 bends, and in order that they may cross one another without requiring sharp humps or other objectionable formations, they are made of different lengths, so that the bottom portions of the several pipe bends will be located at different
35 levels, permitting one pipe bend to pass above the bend of another pipe, as shown best in Fig. 8. As the several pipes 33^b cross each other when viewed from above (see Fig. 9), they form a basket-like structure which will readily hold the
40 ice placed in the cooler W.

In the original bar-like blank or body A, Figs. 1 and 2, all the units (each containing a U-shaped channel 20) are in line with each other, and therefore together take up a considerable length.
45 By dividing said body into units as described and re-arranging these units, I obtain a manifold the length of which is smaller than that of the original blank or body, and which therefore can be placed within a relatively short cooler box. This
50 is an important advantage of my invention, because space requirements call for the employment of relatively short cooler boxes, while there is no serious objection to an increase in the width of the cooler boxes (the dimension measured from
55 left to right in Figs. 5 and 6).

In some cases I may use various combinations of pipes and manifolds, and various other modifications may be made without departing from the nature of my invention as set forth in the appended claims. I have illustrated constructions
5 employing a single manifold, as in Figs. 8 and 9, or two manifolds, as in Figs. 5 and 6, but I desire it to be understood that the number of manifolds may be altered to suit the conditions of individual cases. 10

I claim:

1. A manifold composed of connected units each of which is arranged at an angle to the adjacent unit, each of such units having a U-shaped channel with two open ends facing in the same
15 direction and a longitudinal web intervening between the parallel members of said channel, each unit being provided with tubular outwardly-tapered portions surrounding the open ends of the U-shaped channel, and with inwardly-tapered
20 annular grooves surrounding said tubular portions, said tapered tubular portions projecting beyond the outer circumferential walls of the respective annular grooves.

2. A manifold composed of connected units
25 forming together an annular series, each unit having a channel with two open ends, in combination with U-shaped connecting pipes each of which has one of its ends connected with a unit on one side of said annular series and its other
30 end connected with a unit on the opposite side of said annular series to form a basket-like structure.

3. A manifold composed of connected units forming together an annular series, each unit
35 having a channel with two open ends, in combination with U-shaped connecting pipes each of which has one of its ends connected with a unit on one side of said annular series and its other end connected with a unit on the opposite side of
40 said annular series to form a basket-like structure, the said connecting pipes being of different lengths and crossing one another at their bends.

4. A manifold having a U-shaped channel with two open ends and a longitudinal web intervening
45 between the parallel members of said channel, and provided with inner tubular outwardly-tapered portions surrounding the open ends of the U-shaped channel, and with inwardly-tapered annular grooves surrounding said tubular portions,
50 said tapered tubular portions projecting beyond the outer circumferential walls of the respective annular grooves.

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