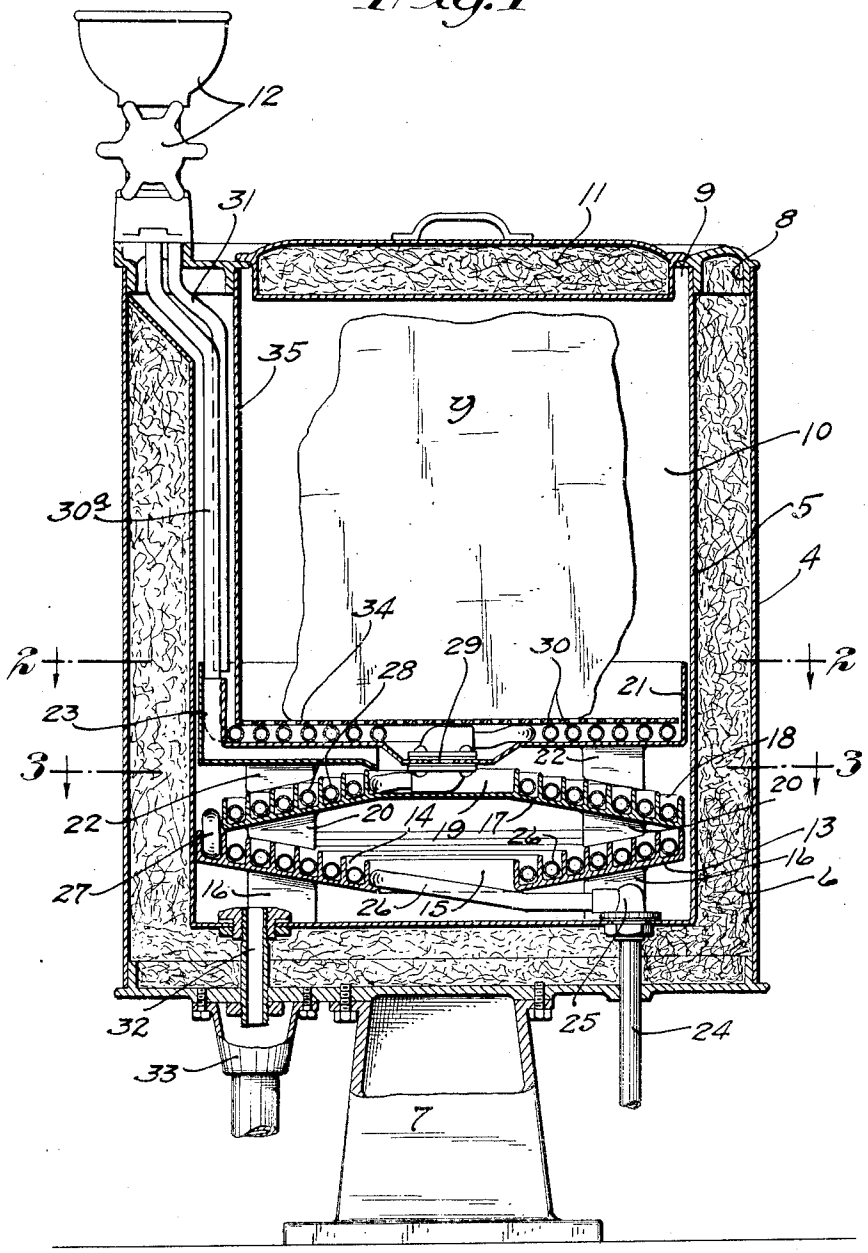
March 6, 1928. 1,661,385

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WATER COOLING DEVICE

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Fig. 1



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Fig. 2

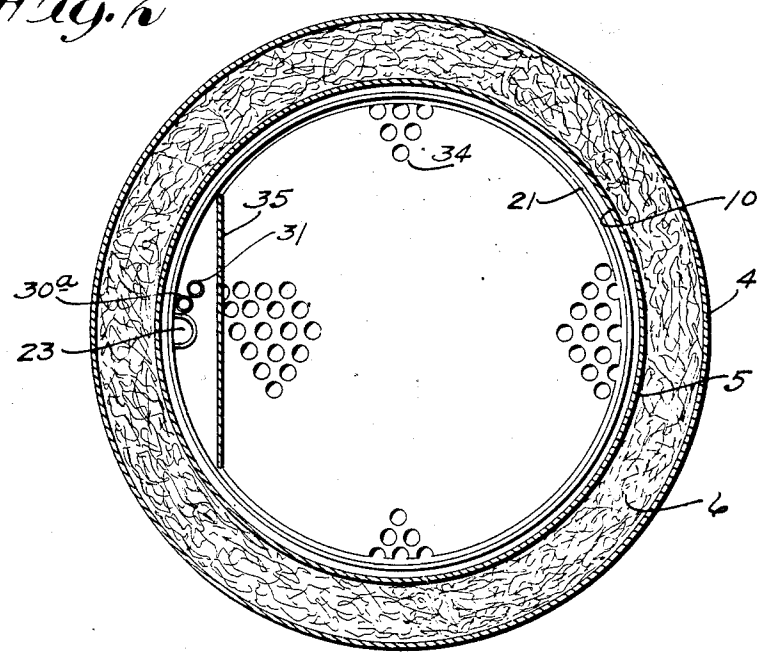
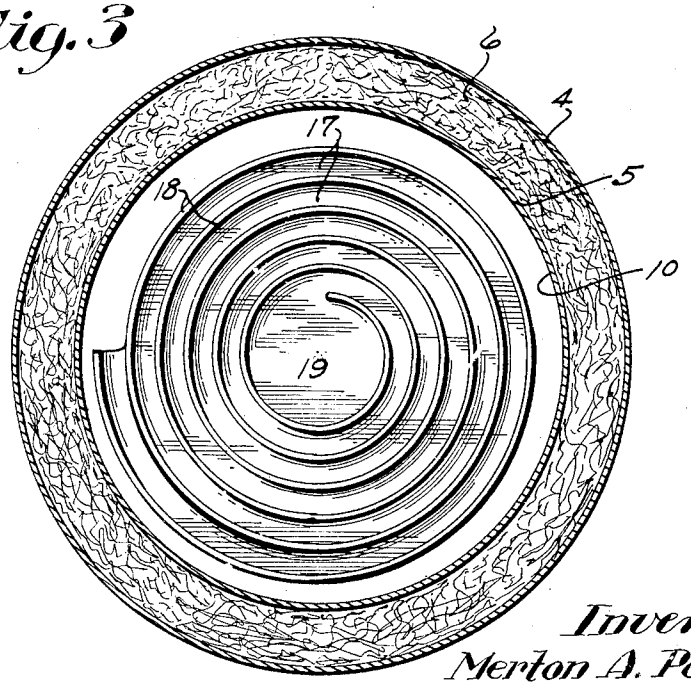


Fig. 3



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UNITED STATES PATENT OFFICE.

MERTON A. POCOCK, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO CARTER-MAYHEW MANUFACTURING COMPANY, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

WATER-COOLING DEVICE.

Application filed March 4, 1927. Serial No. 172,643.

My invention relates to water cooling systems involving the use of drinking fountains, and is in the nature of an improvement on the water cooling system disclosed and broadly claimed in the Ridler United States Patent No.1,539,867 of date June 2, 1925, and which patent is now about to be reissued.

The present invention, in common with the Ridler patent, utilizes the cold waste water from the fountain as an important feature of the water cooling means but it involves other and highly important features whereby the cooling action is improved and whereby the manufacture and cost of the apparatus is reduced.

Generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The device will take various forms but is exemplified in a commercial form of the apparatus embodying what is at present thought to be the preferred form thereof, and is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a vertical axial section of the cooling apparatus;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1; and

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1.

The body of the apparatus illustrated is cylindrical and it comprises spaced outer and inner shells 4 and 5 between which insulating material 6, such for example as granulated cork, is interposed. This cylindrical body which affords an outer casing is shown as supported by a pedestal 7, and its substantially annular top is shown as closed by a rim casting 8 that affords a large central opening 9 through which cakes of ice *y* may be inserted into the interior of the casing. The inner shell 5 is preferably of galvanized sheet metal, copper or other non-rustable material, and the interior thereof affords a refrigerating chamber 10. The ice passage 9 is normally closed by a removable cover 11.

The numeral 12 indicates as an entirety a bubbling fountain of standard or any suitable structure and which, as shown, is applied directly on the annular rim casting 8. Within the refrigerating compartment 10 is a plurality of pans, as shown three in number, the one superimposed on the other. These pans may be cast or of any suitable metallic structure. The lowermost pan 13, as preferably made, is downwardly curved and is formed with a spiral open topped channel 14 that follows a conical surface and at its inner extremity is open for discharge through a large central opening 15. This lower pan 13 has depending rest lugs 16 that rest on the bottom of the inner shell 5. A pan 17 just above the lower pan 13 is of reverse conical form, that is, is upwardly convex and has a spiral open topped channel 18 which, at its upper extremity, leads into a central basin 19 formed as a part of said pan 17. This pan has depending rest lugs 20 that bear on the spiral flanges of the lower pan 13. The upper pan 21 has rest lugs 22 that bear on the spiral flange of the pan 17. This pan 21 is provided with an overflow conduit 23, the upper extremity of which is below the rim of said pan 21 and the lower portion of which is extended below the bottom of said pan and terminates in position to deliver into the basin 19 of said pan 17.

A drinking water supply pipe 24, from the city water supply or elsewhere, is brought in through the bottoms of the shells 4 and 5 and by a coupling elbow 25 forms a water-tight joint with the bottom of the shell 5 and is connected to the inner extremity of a spiral coil 26. This spiral coil 26 follows and is seated within the spiral channel 14 of the pan 13 and the outer extremity of this coil 26, by an elbow 27, is joined to the outer extremity of a similar reversely wound spiral coil 28 that follows and is seated in the spiral channel 18 of the pan 17. The inner extremity of the coil 28, by a coupling 29, forms a water-tight joint with the bottom of the pan 21, is connected to the extremity of a third coil 30 that rests on the flat bottom of said pan 21. The outer extremity of the coil 30 has an upward extension 30^a that leads to the discharge nozzle of the drinking fountain. The numeral 31 indicates a waste water overflow pipe that extends downward from the bowl of the drinking fountain and terminates in position to discharge the cold waste water into the upper pan 21. The inner shell 5 is

provided with a short waste water discharge pipe 32 that delivers into the head of a waste water discharge pipe 33 secured to and depending from the bottom of the outer shell.

Placed immediately on top of the flat coil 30 is a false bottom in the form of a perforated metal plate 34, at one edge of which is secured an upstanding guard plate 35, the upper end of which latter is seated against the rim 8 and protects the pipes 30a and 31 from the ice cake *y*, which latter is placed directly on said false bottom 34.

With the above described arrangement, the cold waste water from the bubbling fountain and the melting ice water delivered into the upper pan 21 will overflow through conduit 23 into the basin 19 and from thence will start a spiral downward and outward course through the spiral conduit 18 of pan 17 and from thence will take a downward and inward spiral course in the spiral channel 14 of pan 13. From the inner extremity of the channel 14 the waste water will run to the bottom of the inner shell 5 and from thence will escape through overflow pipes 32 and 33. The flat coil 30 is of course always submerged in cold water contained in the upper pan 21. With this arrangement, not only the waste water from the bubbling fountain but from the melting ice is caused to flow around and keep more or less submerged all three of the coils 26, 28 and 30.

Here it is highly important to note that the flow of the drinking water on its way to the fountain through the coils 26 and 28 is in a reverse direction to the flow of the waste water from the fountain through the spiral channels 14 and 18. This brings the relatively warm incoming drinking water and relatively cold escaping waste water into a reverse heat exchange relation while following the same tortuous courses, and with the result that the heat exchanged may be advantageously carried out substantially down to the temperature point where, at the discharge end of the channel 14, the temperature of the waste water has been reduced substantially to that of the incoming drinking water.

Moreover, the arrangement described brings the various elements into a very compact relation and affords a structure that may be made and assembled at comparatively small cost. The apparatus illustrated is cylindrical in horizontal section and the co-operating pipe, coils and channels are true spirals, but of course very considerable deviation may be made from these forms so long as the general co-operative relation is maintained, all within the scope of the invention herein disclosed and claimed.

The term "drinking fountain" is herein used in a broad and liberal sense to include a device for dispensing water and having means for engaging and returning the cold waste water.

What I claim is:

1. The combination with a refrigerator and a drinking fountain, of a plurality of superimposed pans within said refrigerator, a waste water conduit extended from said drinking fountain and delivering into one of said pans, and a drinking water supply pipe extended to said drinking fountain and having coils located in the several pans and subject to exchange of temperature with the waste water discharged through said pans, certain of said pans having spiral channels in which the coils of said drinking water supply pipe are placed.

2. The combination with a refrigerator and a drinking fountain, of superimposed pans within said refrigerator, adjacent members of said pans having spiral channels, the one expanding radially outward and the other contracting radially inward, the outer portion of the upper channel delivering into the outer portion of the lower channel, and a drinking water supply pipe having coils placed in said reversely spiraled channels and following the same from the inner portion of the lower channel to the outer portions of both channels and from the latter to the inner portion of said upper channel, the said water supply pipe extending to said drinking fountain, said fountain having a waste water pipe combined with means for delivering the waste water into the inner receiving end of said upper spiral channel and the inner delivery end of said lower spiral channel being open for the discharge of waste water therefrom.

3. The structure defined in claim 2 in further combination with an upper pan placed above the two pans noted and having an overflow conduit arranged to deliver to said upper spiral channel, said drinking water pipe having a coil placed on the bottom of said upper pan and the waste water pipe from said fountain being arranged to deliver into said upper pan.

4. The structure defined in claim 2 in further combination with an upper pan placed above the two pans noted and having an overflow conduit arranged to deliver to said upper spiral channel, said drinking water pipe having a coil placed on the bottom of said upper pan and the waste water pipe from said fountain being arranged to deliver into said upper pan, a perforated false bottom placed on the coil in said upper pan, and a guard plate extended from said false bottom to protect said waste water pipe in the upper portion of the drinking water supply pipe from ice contained on said false bottom.

In testimony whereof I affix my signature.

MERTON A. POCOCK.